The Earth twice shaken wonderfully;

OR, AN

Analogical Discourse of Earthquakes,

its Natural *Causes*, *Kinds*, and manifold *Effects*;

OCCASIONED

By the last of these, which happened on the Eighth Day of *September* 1692., at Two of the Clock in the Afternoon.

Divided into

Philosophical Theorems, pick'd out of many Famous, Modern, and Ancient TREATISES,

Translated into *English*;

With Reference to that unusual One, that happened in Queen *Elizabeth*'s Reign, on the same Day, 8*th*. of *September* 1601. at the same Hour, which was sensibly felt throughout all *Europe*, and some part of *Asia* in the same Moment, as much as it is found out.

ADORNED,

With an Account of many stupendious and wonderful Events in *Germany*, *Italy*, and other Kingdoms.

WHEREIN

Some *Observations* are made upon the *Circumstances*, wherein these Two Earthquakes agree, and the others wherein they differ.

By *J. D. R.* French Minister.

Joel 3. 16. *The Lord shall roar out of* Sion, *and utter his Voice from* Jerusalem, *and the Heavens and the Earth shall shake; but the Lord will be the Hope of his People*, &c.

LONDON: Printed for the Author, at *Sion's Colledge*, near *Cripplegate*; and to be Sold at Mr. *Cockrel*, Bookseller, at the Sign of the *Three Legs* in the *Poultry*, and at Mr. *Vaillant*, French Bookseller, in the *Strand*, over-against the *French Savoy*'s Church, 1693.

IMPRIMATUR.

January the 1st.
169⅔.

Edward Cooke.

For the ever Honoured and Worthy *Thomas Brown*, of *Alsey*, in the County of *Bedford* Esq; a Member of the Honourable House of Commons, in this present Parliament.

SIR,

'TIS *the custom with those that Dedicate any thing, to adorn their Frontispieces with the Panegyrick Praises of their* Mecenas. *In which they create Favours, and Illustrate their own Eloquence, unto which I was always averse: But, forasmuch as the great Demonstrations of your Civilities and Benevolence towards my Family, are always in my Memory*; my Affections could not but be moved with the Earth, *and the Divine Providence at last afforded me an occasion, which I had long sought for in vain, to repay some small acknowledgment of a grateful Mind, by offering unto you the first Fruits of a new Language (the Knowledge of which I attained to in your Neighbourhood) then Dedicate any thing new to you. Nay, 'tis very reasonable that this Treatise should see again the same Country where it began to speak, or rather to stutter.*

Yet if there were any need to mention more weighty Reasons and pass by these, how innumerable of them, might be afforded, known both to me and the whole Nation, in the enumerating of which a whole Volum might be defective? *But that which*

which hath been the greatest Motive with me, was the Piety innate to all your Noble Family, and to your Illustrious Lady, excelling all others both in Beauty of Body, and in great Parts of Mind. To which may be added the Candor and Constancy of your Mind, free from all secular blemish; which Vertues you know how prudently to use in the exercise of Justice, and the distribution of Right to every one, in punishing Vice and Vicious Persons. On which, and on many other things is founded His Majesty's (the most Prudent of Kings) and his Counsel, Judgment, in conferring on you the Magistracy. The unanimous Concord of the whole Country in chusing you to sustain their Parts in the most August English *Parliament, was upheld by this Foundation. On this incorrupted Sincerity, leans the hope of its Patronage, and the Affection of a sincere and faithful Mind, for the Conservation and Promotion of the Present State of Affairs. But many Words become not the Candidate of a Foreign Tongue, especially in so sublime a Matter. Pray, Sir, respect not so much the external Meanness of the Person, as the Gratitude of his inmost Affection, after the Example of that Prince who disdained not willingly to accept of cold Water offered to him in the Hand of a Countryman, his Subject; But having perused this Work, be pleased to accept of it as a Pledge of the eternal Deference I owe to you, and disdain not to embrace it in your Patronage. In the mean time that God will grant an Accomplishment of this, and many other Years attended with his most gracious Benediction to you and all your honour'd Family, and that the effluxion of this Age may be free from all Commotion and fatal Alteration, either of the Earth, or of the Present Affairs of this Kingdom, is the Prayer of*

SIR,

April 9. 1693.

Your most devoted humble Servant,

J. D. R.

THE PREFACE TO THE READER.

THAT common Saying, Objects move Powers, doth not want its Foundation. An Earthquake hath ſerved for the Subject Matter, for the exerciſing of ſo many and ſo great Wits in Old Times, that it may ſeem needleſs to bring it upon the Stage again: The Earth was no ſooner ſhook on the *8th.* of *September* laſt, but that, that ſtupendious Event became the common Argument of the Diſcourſe and Writings of the Learned Men of this Nation. I betook alſo my ſelf to the Conſideration thereof, and ſo ſet out the following *Engliſh* Treatiſe, for my private improvement in this Tongue, without any deſign of publiſhing it, which ſhould never have come in print, had I not been overcome by the Perſwaſions of many qualified Perſons, and of ſeveral others of no ordinary Learning, to whoſe Notice it came without my Privity, when it was finiſhed; which was about the end of *December* laſt, and before the Evangelical Exhortation to Repentance, occaſioned by the Earthquake writ-

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writ by Mr. *Beverly*, and the Book of the Learned Mr. *Ray*, concerning the Changes in the World, came forth.

And altho' it ſeems, that I ought now to be more againſt printing this Treatiſe, by how much the more the number of Writers upon this Subject is increaſed, yet many things being left untouch'd by them, which may give occaſion to Publick Curioſity, and to the Wits of this Nation to exerciſe themſelves about, I have here yield to propound to the World. And as there are many Circumſtances in which the late Earthquake ſeems to agree with that, which happened in the Year 1601. both in the Coujunction of Conſtellations, and the Influence of the Planets, if we may credit Mr. *Patridge*; I thought it not amiſs for the ſatisfaction of the Reader, to give him my thoughts thereon; though I do proteſt that I am very averſe to the Obſervation of Omens, and that I am of a very different Opinion from thoſe who have dared to foretel that ſuch an Earthquake will be itterated here, as was in *Sicily*. God forbid that we ſhould by our ſins draw down his Judgments ſo heavily upon our own Heads, but rather in our Prayers to beg that God Almighty the Maker and Upholder of Heaven and Earth, would be pleaſed to grant unto our Monarch and Monarchy the moſt flouriſhing Proſperity, that the Conſtitution of this Kingdom and theſe happy Iſlands may be at quiet, firm and unmoveable till the end of Ages.

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The Reader may observe that ye last Earthquake happened In ye Kingdom of Naples, was ye 8th day of 7ber 1694

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THE EARTH Twice Shaken WONDERFULLY.

THEOREMS.

AS Rest is contrary to the Nature of Heaven, so is Motion against the Nature of the Earth.

2. But in this they differ, that although no Natural Cause stops the Motion of the Heaven, yet it may give some Motion to the Earth.

3. The Heaven never rested but once, *Josh.* 10. 13. since the Creation that we know of, and then not totally neither, but only in that part which is a Vehicle to the solar Body; but the Earth is often moved.

4. And altho' the rest of the Heaven be in it self a thing as much to be wondered at, as Motion in the Earth; yet the later seems to move and terrifie mens minds more.

5. For the Earth doth more nearly touch us than Heaven, and we are more sensible of danger, when the Foundation of the World trembles

and is ſhaken under us as tho' it were falling, then if any thing happen above our heads, or that which was moved above us move no more.

6. Which Events as they do affect mens minds with a ſingular, and as it were an amazing Admiration, ſo they excite and ſtir them up more diligently to enquire after the Cauſe of the which, beſides our own experience. *Ariſtotle* Witneſſeth in the *1ſt.* Book of his *Metaphyſicks, Cap.* 2. διὰ τὸ θαυμάζειν οἱ ἄνθρωποι καὶ νῦν καὶ τὸ πρῶτον ἤρξαντο φιλοσοφεῖν. *Becauſe of Admiration, Men began both now and of old to Philoſophize.*

7. Seeing therefore that, that Earthquake which formerly happened on the 8*th.* of *September*, 1601. between one and two of the Clock at Night, ſtruck almoſt all the Inhabitants of *Europe* with Admiration. I doubt not but that which happened lately on the 8*th.* day of *September* laſt, excites many to the ſearch of the Cauſe and Nature of them.

8. Neither is this tracing, even of wonderful and unaccuſtomed Events, by their cauſes any ways diſpleaſing to God, ſeeing Effects themſelves are more clearly underſtood, when the Cauſe is known, and the clearer Knowledge of Divine Works, begets clearer notice of God himſelf, and excites in us a greater fear and awe of him: for clearneſs in the Underſtanding begets efficacy in the Will and Ardour in the Affections.

9. Whilſt therefore the Learned communicate to the World their Thoughts and Obſervations of that unuſual Earthquake which no ſmall part of the World felt, which Obſervations they gather from the Remarks they make of the different Events that happened here and there, eſpecially ſince that Town in *Jamaica* was almoſt ſwollowed up by an Earthquake. I have been likewiſe prevailed upon to put forth ſomething that might be as an earneſt, if by chance, by the *comparing of Opinions, the cauſe of this ſo ſtupendious an Event might more truly and plainly appear.*

10. I ſhall diſtribute the whole Matter into Four Chapters. The Firſt of which ſhall be of the Kind and Form of this Earthquake; The next of the efficient Cauſes; and the Third of the Effects, and of their Signification and Preſage, at leaſt as ordinary and common. *Fourth*, To which ſhall be joyned an Examination of Unformity or Diſparity of one from another, both in their Form, and in their Cauſes and Effects.

CHAP.

CHAP. I.

Of the Kind and Form of this Earthquake.

§ 1. THere are two ſorts of Earthquakes, Trembling and Pulſation. The differences of Earthquakes or their ſeveral Kinds, may be derived either from the Force of the Spirit iſſuing out of the Superficies of the Earth, or from the ſound then made, and from other accidents and effects. Hence it is, that in *Lib. de Mun.* There are reckon'd eight ſorts of Earthquakes. *Georgius Agricola lib. 2. de ortu ſubter.* Makes four ſorts of 'em, a Trembling when it quivers laterally; Concuſſion when 'tis moved on high and ſhelving (*in ſublime & devexum*;) arietation when contrary blows ſhake it. Laſtly, inclination when it is rowled like Water and the Waves. But the ſame Author in his fourth Book of thoſe things that proceed out of the Earth, *pag.* 14. more accurately divides Earthquakes into ſimple and compounded, and then ſubdivides both into their Species. *Ariſtotle 2. Metaphys*, reduces all ſorts of Earthquakes to two general Heads, to wit τὸ τρόμον a trembling and σφυγμὸν *Pulſus*, which diviſion I thought good to follow in this place.

12. A Trembling is a Motion of the Earth according to its Latitude to the right and left ſide. *Ariſtotle* in the forecited place (*ſays*) that τρόμος *i. e.* trembling is towards the ſides, and calls it alſo παλμὸν and παλμυθίαν from πάλλω which ſignifies to brandiſh: for the leaping of the Earth is, as it were, a brandiſhing. And this ſort of Earthquke is frequent, but *Pulſus* and *Arietation*, as they call them, are more ſeldom, which *Ariſtotle* teſtifieth in his ſecond Book of his *Metaphys*, *chap.* 8. Pulſus ſeldom ſhake the Earth, for beginnings are not ſo eaſily multiplied, *&c.*

13. *Pulſus* is a motion of the Earth according to its Longitude, to wit, when it is moved up or down. *Ariſtotle* ſays, σφυγμός ἐστιν ἄνω καὶ κάτω and divides it into συστολὴ καὶ διαστολὴ *Syſtole* and *Diaſtole*: to wit, either when the Vapour or Exhalation going up with violence, heaps up great Piles like Mountains, or removes or breaks Mountains themſelves, or laſtly ſucks them into the Earth in its vaſts gaping, as *Pliny*, Speaks.

14. But that Earthquake whereof we have ſpoken in the beginning, was different according to the diverſity of places where it was.

15. In plain places 'twas a Trembling, becauſe it ſhook the Earth lateraly to the right and the left. Thoſe who then felt the Quaking, affirm it to have been a lateral one, like the rocking of a Cradle, and that thoſe who lay in the ſame Bed, that night it happened, were violently juſtled one againſt the other, the cloaths being carried from ſide to ſide; but wheither or no, there were the ſame ſort of Quaking in all the places where it was. I am not very farward to affirm. But one may be bold to conclude from the Event, that in moſt places, the Earth was not violently thruſt forward, but did moſtly tremble. And although this trembling (*Tremor*) be counted leſs perilous than either *Pulſus*, Arietation or Inclination, yet it doth not want its dangers, as thoſe ſpecially then experienced that lived in the higheſt Houſes and in Caſtles, from whence the Voices and Exclamations of the Guards, were heard every where throughout the Country, for when the Cradle is moved too much either to the right or left, there is danger of the Child's falling out, ſo when the Fondations or Buildings be moved laterally, both the Walls are in danger, eſpecially in Towers where the ſubſterraneous Spirit being included within the Arches, doth as it were, force the Tower more either to this or that ſide; otherwiſe the higher the Walls are, the more ſenſible is the ſhaking (called, *Vibratio.*) This is certainly apparent from Hiſtory, that the Town of *Scarp*, not far diſtant from *Florence*, in the Valley of *Mugellum*, between the *Veſuvian* and *Apennine* Mountains, in the year 1541. on the 3. of *July* did firſt Quake by ſuch a ſort of Vibration, and afterwards was ſo ſhaken, that moſt of the Houſes were ruined, great Cracks and Chinks being made in them, and 500 of the Inhabitants were deſtroyed, which Earthquake is related by *Georg. Agricol. A lib. de Natura rerum è terra effluentium pag.* 151. who Writ his Book the ſame year the Town *was made ruinous.*

16. But in Mountainous places, to this Trembling was added a *Pulſe.* Earthquakes are more noxious in Mountains than in Valleys, by reaſon the more frequent ſubterraneous Cavities which there lye hid, into which the Spirits are more copiouſly gathered and prevail more ſtrongly, but eſpecially where the ſuperficies is ſolidly compacted and ſmoothly levelled. *Plinius lib.* 2. *cap.* 8. (ſays) *Nec montoſa talicarent malo*, neither do the Mountains are without ſuch an inconvenience (evil.) I am ſure the *Alpes* and *Apennine* Mountains have often trembled, which gave occaſion to that of *Virgil Inſolitis trepuerunt Motibus Alpes.* And the H. Scripture, ſays, *Naham.* 1. *The Mountains are moved by God.*

Swit-

Switzerland also felt it at the very same time. A noted Witness of which speaks after this manner. 'Whilst I was Travelling in *Switzerland* in *September* and *October*, I found Men's minds terrified 'more by that Earthquake, than I perceived they were in the more 'close parts of *Germany*. And that it was not a simple Trembling 'of the Earth, but a certain *Pulsus* and Concussion joyned with a 'Trembling, those things that I saw every where in those parts, 'the Effects of this Earthquake, sufficiently demonstrated to me, of 'which I will mention but one. There is a high and craggy Moun-'tain two Hours Journey distant from *Lucern*, not very remote from 'that stupendious Mountain which *Pomponius Mela*, call, *Fractum* '*Montem*, the Vulgar (I know not by what sort of superstition) *Pi-'lat*'s Mountains, but the Inhabitants call it *Burka* (if I do remem-'ber) under this Mountain on the Eight of *September*, about Two a 'Clock at Night, there arose a dreadful Bellowing and Fragor to 'the great Consternation of the Inhabitants that live thereabouts; 'there were elevated into the Air, as it were thick Fumes, which 'filled all the Neighbourhood; at lenghth the greatest part of the Top 'of the Mountain was broke off with a great noise, and tumbled 'down into the Lake of *Lucern*, which runs by it, but from the 'other part of the Mountain, which other People (called *Under-'waldenses*) inhabit, some part also being violently thrown down, 'is reported to have buryed seven of the Inhabitants: so in the 85*th*. 'year of the last Age, part of the Mountain was broken off, three 'hours Journey distant from a certain Village called *Hyborn*, under 'the Jurisdiction of the Canton of *Bern*'s; situated above the Lake '*Lemanus*, from which issued a vehement Wind, which carried with 'it Stones, Clods, and Trees; so that having passed over the in-'terjacent Hills, at the length the mesurable Village it self was over-'whelmed and oppressed which the Destruction of its Inhabitants. The like Examples do every where occurr in History and *Seneca*, *lib*. 6. *Nat. quest*, reports out of *Thucidides*, that *Atlas* was cleft and broken by an Earthquake not far from *Locris*.

17. Moreover one Earthquake is less frequent than another, and more extraordinary; one being purely miraculous, the other compounded both of Miracle and Nature.

18. An Earthquake meerly miraculous is, when the Earth is shaken by the immediate power of God, without the intervention of any Natural Cause.

Of which sort was that which happened at the suffering of Christ,

Matth.

Matth. 27 51. *Pliny* mentions a certain great Earthquake *lib.* 2. *Cap.* 84. in the time of *Tiberius Cæsar*, *Maximus*, (say he) *terræ memoria mortalium motus accidit Tiberii Cæsaris principatu, duodecim Urbibus Asiæ una nocte prostratis*, i. e. The greatest Earthquake in the Memory of Men happened in the Reign of *Tiberius Cæsar*, Twelve Cities of *Asia* being laid level in one Night. *Cornelius Tacitus* in the end of his second Book, names them. But *Niæphorus*, *lib.* 1. *Cap.* 17. saies, Fourteen were destroyed. Saint *Austin*, *lib.* 2. *de mirabilibus. Scripturæ* Writes that Eleven Cities in *Thrace* were destroyed by that Earthquake, which happened at our Saviour's Crucifixion. *Eusebius* reports from *Phlegon* (an old Author) that many Houses in the City of *Nissa*, in *Bithynia*, fell down by the same Earthquake. But that Earthquake which *Pleny* mentions, could not be that, which happened at Christ's Crucifixion; for they do'nt agree in the numbers of years, for those Twelve Asiatick Cities fell in the third year of *Tiberius*'s Reign, but Christ suffered in the 18*th* years of the Reign of that Emperor, or thereabouts. Moreover the saying of *Dydimus* is quoted concerning that miraculous Earthquake which was at the suffering of Christ, who says, *Terræ Motus*, &c. Earthquake often happened, but those which were before and after Christ, were only in some part of the Earth, but in the time of my Saviour Jesus Christ, it was not some particular Earthquake, but the whole Earth was shaken and torn from its Center: But I know not what credit one may give to this Opinion of *Dydimus*. The Scripture says, the Earth is so founded, that he shall never be moved, *viz.* as to its Profundity and Center, Psal. 104. 5. *He hath founded the Earth upon its basis that it should not be removed for ever.* A paralel place, to which is in *Eccles.* 1. 4.

That Earthquake also happened at the Resurrection of Christ, is to be referred to those that are purely miraculous, *Matth.* 28. 2. as is also that spoken of in the 4*th.* of *Acts* 31. and that, *Acts* 16. 26. and also that which happened a little before the Promulgation of the Divine Law, *Exod.* 19. 18. and that opening of the Earth that swallowed up *Corah*, *Dathan*, and *Abiram*, Numb. 16. 21. And that which is mentioned, *Amos* 1. 1. and *Zac.* 14. 5. Yea, *ye shall flie like as you fled from before the Earthquake in the days of Uzziah King of Judah*, which, *Josephus lib.* 9. *antiq. cap.* 2. describes.

19. A mixt Earthquake, is that which hath a Natural cause, but extraordinarily, as it were increased by God, and in some sort enlarged

larged beyond the Power of Nature. God often makes uſe of Natural Cauſes in the production even of miraculous Events, leſt the Agents might not be hindered without neceſſity, and that he might ſhew that the Power of Nature, and ſecond Cauſes are not at all repugnant to the Divine Power, but ſubordinate to it. And, *Laſtly*, That he might ſhew that he hath the Power of Nature in his own hands and diſpoſal, and that he can either augment their force, or diminiſh it.

20. And this Earthquake is obſerved to be twofold.

21. One is reſtrained to ſome certain Place, and included within ſome tract of Ground, ſo that it hath an unuſual vehemency of Spirits under-ground, and wonderfully increaſed, from which ariſes deſtructive and great hurt. Of which ſort was that Earthquake which happened in the 20*th*, or as other reckon the 22*th*, year of Chriſt, of which we ſpoke before, whereby 14 Cities of *Aſia* periſhed. Such a one was that alſo that happened in the Reign of *Herod* the Great, by which many Cities, Towns, and Villages being demoliſhed in *Judea*, 30000 *Jews* periſhed, as *Joſephus* ſays, in his 1*ſt*. Book of the Wars of the *Jews*, *chap.* 14. So from the year of Chriſt, 1170. to the year, 1345. all *Germany* was four times moſt grievouſly ſhaken, as one may ſee from *Funccius*, *Stumpfius*, *Sigonius*, *Cedrenus*, and others.

22. Some Earthquakes are unuſual and remarkable in reſpect of their Latitude and Celerity, ſo that a great part of the World is ſhaken, and that ſome time quickly as it were, in an Hour or in a Moment. Which ſort of Earthquake Hiſtory mentions to have happened in the time of *Valentinian* the Emperor, in the year of our Lord 369. by which the whole Earth was moved, in ſo much that many Iſlands in the *Eaſt*, with a great multitude of Men periſhed by Inundation, which is atteſted by *Socrat. lib.* 4. Hiſt. *Eccleſ. cap.* 32. *Amianus Marcellinus*, in the end of his 26 Book. *Paul Oroſius*, *lib.* 7. Hiſt. *cap.* 32 *Funccius* in *Chronol.* ſo in the year of our Lord 1117. almoſt all the World ſhook, many Buildings being demoliſhed every where by it, as *Stumpfius* relates, *lib.* 4. *cap.* 40. but in the year 1443. an Earthquake ſhook *Poland*, *Hungary* and *Bohemia*. King *Ladiſlaus* being not long after killed by the *Turks*, with a great overthrow of the Chriſtians.

23. To this ſort of Earthquakes is referred that wonderful and unuſual one which happened in the year 1601. on the 8*th*. of *September*, between one and two of the Clock at Night.

24. For

24. For 'tis not probable that so great a Tract of this terren Globe, as that Earthquake passed through, could be moved by the ordinary and accustomed force of Nature, which not only our *European* Hemisphere, *Germany*, *France*, *Italy*, *Hungary*, *Bohemia*, *Thrace*, but *Asia* it self is reported to have felt. We have not yet heard for certain how far that Earthquake reached into *Asia* and *Africa*, but this is certain, that the greatest part of *Europe* trembled, and that, almost at the same Moment. Some Reports have lately been hatched, that say, that two Towns called by the Turks *Tartos* and *Copra*, were swallowed up by the gaping of the Earth, caused by that Earthquake, to the great Consternation of the Turks, who from that time believed that sinistrous and unlucky Events were pretended to their Empire, which, if true, may make it apparent, that this Earthquake was not every where a Tremor, but in some places a *Pulsus* and διαστολὴ: to wit, where the Spirits abound, or the Ground is porous or gravelly; as it is about the *Euxine* Sea, and at *Constantinople*, which City, if any in *Europe*, is infested with frequent and pernicious Earthquakes.

In the year of our Lord 1356. it was so grievously shaken, that a great part of the Walls, where it looks into the Sea, fell down, with many Towers and Buildings, so that 13000 Men perished in the City, the Earthquakes lasting incessantly for 18 days. *Agathias*, *lib.* 5. *pag.* 541. relates a dreadful Earthquake that happened in this City. A little while before these thing happened (in the time of *Justinian*) the Earth was so dreadfully shaken at *Bizantium*, that almost all the City fell down, after which another Earthquake ensued, that was so great, that I think there never was, nor will be the like again.

25. There are therefore two things in that Earthquake which make it extraordinary and very miraculous, the breadth, and that it penetrated those places, which are not subject to Earthquakes: and the Celerity of it.

And although the Mischiefs it caused in some Parts, may assure us of its vehemency, yet 'tis not so stupendious for its Mischiefs, as for its Latitude, Celerity, and Prelage. For we read in History of far more dreadful havock and destruction made by some other Earthquakes; and moreover we know from Physical Principles, that those Tremblings that extend fartherest, are not so highly distrustful. For the force of Subterraneous Spirits, the more 'tis dissipated, the more languid it is.

CHAP.

CHAP. II.

Of the Cauſe.

26. WHether a Natural Cauſe can be aſſigned for both effects we muſt now enquire.

27. That there was a Natural Cauſe (although not alone) is evident from Obſervation.

28. For the time it ſelf is ſuch at is convenient for a Natural Earthquake, to wit, *Autumn*, and alſo near the *Equinox*, for about that time Earthquakes are wont to happen. *Ariſtotle* 2 *Meteor cap.* 8. ſays, truly Earthquakes happen chiefly in *Autumn*, be cauſe thoſe times are moſt Windy: Which *Pliny* alſo relates, *lib.* 2. *cap.* 8.

29. It was alſo two of the Clock in the Morning, which is eſpecially adapted for Earthquakes. So *Ariſtotle* in the forecited place, ſays, there are more and greater Earthquakes in the Night, and adds, καὶ πρὸς ὄρθρον μᾶλλον, eſpecially in the Morning. And *Pliny* in the forecited place, ſays, the Morning and Evening Earthquake are very great, but at the approach of day they are frequent, for the heat of the day diſſolves and diſſipates their matter. Natural cold contracts and binds it.

30. The conſequent effects alſo do Evince that the Power of Nature was preſent.

31. For noiſes and fragors iſſuing out of the Caverns of Earth, were heard about that time in the Neighbourhood, which is a certain diſcovery of the Spirits and Winds agitated in the Cavities of the Earth, and as it were there ſtriving reciprocally. If but a little Wind blows into a Veſſel, a ſound, and as it were, a bellowing is heard. One from whence may conclude, what happen in ſo ſpacious Caverns as thoſe of the Earth. Hence it is, that *Ariſtole* ſays, The *Spiritus* makes a noiſe under the Earth, as the Air being beaten up, ſounds variouſly, for there is no difference between this Spiritus and the Air (as to the effect of the ſound) for this Spiritus verberating upon every thing is it ſelf verberated upon: And *Pliny lib.* 2 *cap* 8 ſays, There goes before and accompanies them a terrible noiſe, otherwiſe a murmuring like to bellowing or the cry of Men, and the ſound fragour of claſhing of Arms, according to

the quality of the Matter receiving it, and the form either of Cavern or Cuniculus through which it permeates, *&c.*

32. Alſo great Winds have raiſen after an Earthquake, when a Calm has immediately preceded it. This is alſo witneſſed by experience, and by *Ariſtotle* and *Pliny* in the forecited places, that Winds do ariſe after an Earthquake, becauſe thoſe Winds which where before ſhut in the Earth, do brake out of it into the Air. And ſame Author do aſſert the ſame concerning the Calm, to wit, that it commonly goes before an Earthquake. In a Calm towards Morning eſpecially, ſays *Ariſtotle*, there happen very many and very great Earthquakes, becauſe moſt of the Matter of the Winds is ſo reſtrained in the Caverns of the Earth, that it cannot move the Air: Yet we muſt not deny that even ſometimes in windy Weather Earthquakes have happened, becauſe all the Matter of them doth enter into the Caverns of the Earth together. And even at the time of our Earthquake about three hours before it was obſerved to be ſomewhat riſen; and I will not here make any tedious diſpute with *Geor. Agric.* who ſays, *lib* 4. *de Natura eorum quæ effluant è terra*, That *Ariſtotle*, when he mentions the darkneſs of the Sun, the calmneſs of the Weather, cold, a thin Cloud extended in length, did not intend to diſcover the ſigns of Earthquakes (which *Ariſtotle*'s Interpreters affirm) but prove by thoſe things which ſometimes happen, that Wind is the Cauſe of Earthquakes. But both may be aſſerted without abſurdity, to wit, that they are ſigns of Earthquakes to come, and alſo evince that they are occaſioned by Wind.

But here we do not only acknowledge Nature, but joyn with it a ſingular force of Divine Power, neither ought we to ſeperate Divine Operations even from thoſe that are uſual and often happen: ſeeing the very Heathens believed that there was no Earthquake, tho never ſo ſmall, but had ſomething Divine in it, as it is teſtified by *Gellius lib.* 2. *cap* 28 But as often as the Scripture ſpeaks of Earthquakes (which is often) ſo often do they divert our minds from the conſideration of Nature alone, to the acknowledgment of the Omnipotent Power of the Lord, as Pſal. 60. 2. *Thou haſt made the Earth to tremble, thou haſt broken it*, and Pſal. 77. 19. Pſal. 114. 4, and 7. *Tremble thou Earth at the preſence of the Lord, at the preſence of the God of Jacob*: Alſo, Pſal. 104. 32 *He looketh on the Earth and it trembleth; he toucheth the Hills and they ſmoke*, Job. 9. 6. *Which ſhaketh the Earth out of her place, and the Pillars thereof tremble*, Nahum 1. 5. *The Mountains quake at him, and the Hills melt.*

33. But

33. But what ſhould be the next Natural Cauſe of ſo ſtupendious Effects, to wit, ſo great Latitude, and ſo great Celerity in this Earthquake? This I confeſs is difficulte to *Trace*, but I hope, I ſhall have leave to enquire diligently into it.

34. Which that I may do, I will firſt ſet down ſome Principles, where one may have good aſſurance for ones Credit.

35. Seeing the Earth is round like a Globe, it hath Lines drawn from the Center to the Circumference.

36. Theſe Lines meet nearer about the Center, then at the Circumference where they are farther diſtant.

37. Therefore the nearer any thing is the Center of the Earth, the more cloſely is it contracted, ruſhing violently from thence to the Circumference, 'tis extended farther, and occupies more room.

38. The Spiritus or Vapours are ſometimes more deeply hid towards the Center of the Earth, but ſometimes (and that more frequently) they are generated in Caverns and Paſſages (*meatus*) nearer the Superficies of the Earth.

From the general Doctrine of Earthquakes in this place; I preſuppoſe the Earth is not otherwiſe moved then by Winds and Spirits engendred in its Cavities, thence ſeeking an Exitus according to the quality of their Natures.

I know the Ancient Philoſophers before *Ariſtotle* aſſigned other Cauſes of Earthquakes, whoſe different Opinions concerning them are recited by *Plutarch*, *lib.* 3. *De Placitis Philoſophorum*, *cap.* 2. *Seneca lib.* 6. *Nat. queſt. Cap* 4. *Pliny lib.* 2. *Cap.* 79. but eſpecially, *Ariſtotle*, 2 *Meteor*, *cap.* 7. But amongſt modern Authors *Joannes Franciſcus*, *Picus Mirandula*, *lib.* 1. *examinis doctrinæ & vanitatis gentium*, *cap.* 12. among which we muſt reckon *Nicholaus Cuſanus*, who *lib.* 1. *de Docta ignorantia*, is of opinion, that the Earth is neither of an Oval form, nor altogether Unmovable of it ſelf. But no Opinion is more evident from Nature and Experience, than *Ariſtotle*, who aſſerts, that Winds and ſubterraneous Spirits are the Cauſes of Earthquakes; for the heavieſt Bodies are only to be moved by that which hath the ſtrongeſt Power to move; But among all inferiour Beings, the Wind or Spiritus is that which according to the qualifications of its own Nature, hath in it a Power more effective of Motion than any other body κινητικώτατον σῶμα, which is expreſly teſtified by Holy Writs, when it aſſimilates Angels to the Winds, *Heb.* 1. 7. and many experiments do alſo evince it: For with how great a force doth a little Gun-Powder diſſolved

into Spirits by the heat of Fire burſt out of the ſmalleſt Machines. So we ſee the Spirit of new Wine when ſeething, if the Funnell be ſtoped, do penetrate the Veſſels, that they may break forth It is ſufficiently known of what Power they are in our Bodies, and what great Convulſions, Symptoms, and Pains they are the cauſes of. So that *Ariſtotle* uſeth this Example chiefly to confirm his Opinion of the Cauſe of Earthquakes.

39. Theſe Spirits being deep in the Earth and cloſely contracted, the nearer they arrive at the Superficies of the Earth, the more they are diſſipated and ſcattered, and ſo they extend further in length and breadth.

40. And they more powerfully endeavour to extricate themſelves; and they iſſue out more ſwiftly, by how much the more they are deeply laid in the Earth, and cloſely contracted.

Which may be proved by the experiment of Fire, which when it is narrowly contracted, breaks forth the more violently in an inſtant, when it hath the opportunity of an Altitude, to convey it ſelf out, which is apparent in Guns, where the igneous force of the Gun-Powder being ſhut in a narrow room, breaks out ſwifter than one can think or imagin.

41. Which Principles being preſuppoſed, let us now ſhew the Cauſe of the Earthquake which we are treating of, which extended ſo far, and was ſo quickly cauſed.

42. It was a Vapour or Spirit ſubtilly diſpoſed and buryed profundly towards the Center of the Earth or at leaſt the Center of *Europe*, or of thoſe Countries that were ſhaken, whence ſallying out in great quantity and number, it ſpread fare and near with wonderful Celerity.

Trembling in the Earth is nothing elſe but the Thunder in a Cloud, ſays *Pliny*, *lib* 2. *cap*. 79. As therefore ſome Thunder reaches further, and diffuſes it more violently than other, both according to the different diſpoſition of the Cloud, and alſo according to the quantity and quality of the Spirit deeply buried in the Cloud, or approaching nearer to its Superficies; ſo the greater or leſſer Latitude and Celerity of Earthquakes, is to be derived from the different diſpoſition and ſituation of the Spirits. And that alſo, which we aſſerted of the Center, is eaſie to be underſtood: For that which is placed in the middle of a Circle or Globe, doth more eaſily move the whole Globe, than that which recedes from the Center towards the ſide of the Globe; which is well known by them who prepare Fireballs,

Fireballs, and throw them into the Air, often to the great Admiration of the Spectators. And I call that the Center of *Europe*, which is in the midſt of that Circle which is drawn from one Extream of *Europe* to the other, in that ſpace of the Terrene Goble in which *Europe* is contained.

43. But whence comes it, that this Spirit is ſo deep, ſo ſubtil, and ſo ſwift? Partly from the firſt, and partly from the ſecond Cauſes.

44. The efficacy of Celeſtical Bodies doth deſervedly claim the firſt place among ſecond Cauſes, which ariſes from their different reſpect to one another, or the mixture of their light and rays. Such is the Power of the Subject as is it ſelf, ſeeing therefore Heaven is the firſt, cheifeſt, greateſt, and ſwifteſt of all Bodies, its Force and Efficacy muſt needs be the firſt, greateſt and ſwifteſt; for Heaven is ſo cloſely connexed with inferiour Bodies, that its virtue may be tranſfuſed into the Earth and communicated to it, even in its moſt abſtruſe receſſes: Whither the efficacy of the ſolar Rays doth reach, is evident from the generation of Metals and other ſubterraneous Bodies, which in no ways poſſible without the Sun and its Rays.

45 The efficay and vertue of *Saturn* this very year was cheifeſt amongſt the Planets, whence it happened that Matter and Fuel was afforded for cold Vapours both above and within the Earth.

'Tis an Aſtronomical Rule confirmed by experience, that the Knowledge of the Earthquake is to be derived from *Saturn*, it being a Planet effective of cold and dryneſs; And the firſt matter of Vapours is cold and dry, which being gathered together at firſt, by the intervention of other Cauſes, grows hot and is rarified.

To which may be added the Quadrate Aſpect of *Jupiter* and *Mars*, in *July*, whereby cold Vapours are made hot and diſpoſed for windy Temperament. 'Tis an old Opinion confirmed by Reaſons drawn from the Nature and Property of Planets; and alſo from experience, that the Power of the three Superiour Planets, *Saturn*, *Jupiter*, and *Mars* is moſt eminent in producing Earthquakes; the firſt by his light doth increaſe cold Vapours, which are made hot by the third, and ſo tempered by the ſecond, that the heat being neither able to ſubdue, nor be ſubdued, there are neceſſarily generated flatuous Vapours, whereof we ſhall ſpeak hereafter.

47 And when the Earthquake happened, the Sun was in the Sign of *Virgo*, which is it ſelf very much adapted for Earthquake.

48. There happened in the foregoing Month of *July* two Eclipſes, the

the Moon on the Fifth, the Sun's on the Nineteenth, and no wonder if at that time divers Vapours were collected within the Earth, so that the Rays of the Sun and Moon being weakned by their being obscured, the redundant humour arising from rain, could not be dissolved and consumed, besides all which, the meeting of two Eclipses in one Month is a presaging Event.

That Earthquake are caused by the Eclipses of the Sun and the Moon; is the Observation of *Aristotle*, 2. *Meteor*, *cap.* 8. and of *Pliny* after him, *lib.* 2. *cap.* 80. which is confirmed by experience, not only the Earth, but also its inmost recesses being penetrated by the heat of their Rays, as by a certain Spirit, are purged from their redundant humours which cannot be when those lights are Eclipsed: For then superfluous humours abound, and also the pores of the Earth which the heat would otherwise open, are shut up, so that the Vapours cannot regularly and conveniently exhale: So says *Aristotle*, 2. *Meteor cap.* 8. Earthquakes happen about the time of Eclipses, for upon the defect of light, necessarily ensues the defect of heat, which is caused by the Sun or Moon throughout the Air. Neither doth that Astronomical Rule want its Foundation; many inconveniencies ensue to the World upon the Obscuration of both the Luminaries of Heaven in the same Month. I don't speake here of that effect of Eclipses which is in *Potentia* and hath its regard to futurities, but of that which is in *Actu* and accompanies an Eclipse considered in it self.

49. To which may be added that which is a nearer Cause, to wit, the Constitution of the Air, which in the preceding Summer was altogether adapted for the Generation of flatuous Vapours.

50. About the beginning of Summer, there was very hot Weather, by which the Earth was prepared and disposed to engender and receive Vapours.

51. Which was followed in the midst of Summer by continual rains, by which the Earth being opened before, by the preceding heat, was so deeply wetted, that abundance of Humours must necessarily have been stored up.

Which concerning the Rain, is attested by *Aristotle* in the aforesaid place, 2. *Meteor*, Earthquake (*says he*) happen in *Spring* and *Autumn*, but especially in rainy Weather, because then there is a greater Exhaltation, which being intercepted in the narrow passages of the Earth, is there shut in; because the Cavities of the Earth are full, but when the Wind is contracted within a narrow place, it has a Power more effective of Motion. And there is a remarkable

place

place in the beginning of the Chapter, where he ſays, that the Earth is of it ſelf dry, yet, but reaſon of ſhowers falling on it, it hath likewiſe much moiſture which proceeds from the Sun and Fire which is in it ſelf, and engenders much Spirits both within and without it ſelf. Neither is there any reaſon why any one ſhould object what *Seneca* ſays, *in quæſt. nat.* That no rain is ſo great as to penetrate or Wet the Earth above two Foot: For that is not true of every ſhower of rain, nor of much and continued rain, neither in the Superficies of the Earth, the only conveyance of rain into the Earth, but it alſo is carried through the Caves of the *Earth* that are open and is in great plenty infus'd into the inmoſt Receſſes of the *Earth*, by Fountains, Wells, and Rivers which are increaſed by rain.

52. To which rainy Weather was added an unuſual cold in the *Dog Days*, by which the Paſſages and Pores of it were ſo ſhut up, that the Humours gathered together in the Earth could not evaporate.

53. And the *South-Weſt* wind blowed for many days together, ſo that the Vapours accommodated for an Earthquake were encreaſed and nouriſhed. For the *South Wind* is warm and moiſt, ſo that it hath been rightly obſerved by *Ariſtotle*, that it is apt both to excite and nouriſh the matter that cauſes an *Earthquake*; and as the *South-Weſt* Wind is near in place, ſo in temper and effect.

54. Which cold Weather was preſently followed by a calmneſs and heat a little before the end of *Auguſt*. So that the Vapours which had been generated by continual Rain within the Caverns of the Earth, grew dry: And a Vapour made warm becomes a flatuous. And when there ariſe ſuch contention between cold matter and heat, in which the cold is neither quite overcome and conſumed, nor the heat is altogether conquerour, winds are engendred. Which is rightly obſerved by Phyſicians in the Bodies of Men, when heat acting upon Phlegm cannot totally conſume it, then are generated Winds.

55. It could not be but that the Vapours contracted within the Earth by the oppoſing cold, both proper to the Earth, and alſo cauſed by the internal Conſtitution of the Air, ſhould be deeply laid. No otherwiſe than if the Spirits are more deeply concealed and conſtrained, when the coldneſs of the Clouds doth reſiſt and conſtrain more ſtiffly.

56. The ſubterraneous Fire ſcattered through the Cavities of the Earth, ſo heated theſe Vapours ſhut up in the Earth very deeply, that it made them more ſubtil and more agil, the Caverns through

through *Europe* and other places being disposed for it, for the Reasons a fore mentioned.

That there is Fire every where scattered through the Cavities of the Earth, both the Fire which in many places breake forth out of the most profound Caves of the Earth doth evince, as also the hot Waters or Baths which rise in many places, to add nothing of the engendring of Sulphur, Brimstone, and other Minerals, in which there is an igneous force and nature. The burning of *Ætna* equally celebrated by Poets and Geographers, is described by *Solinus*, *cap.* 2 *Pleny*, the Nephew of that *Pliny*, by his Sister whose death the *Vesuvian* Mountain caused, say, *lib.* 2 *Epist.* 'Not long 'since the Island *Georgia* (one of those Isles they call the Third) 'shaken by a dreadful Earthquake and gaping, there issued out some 'much Flame, so many Hot Stones, so much Sulphur and burning 'Brimstones which were thrown into the Air, that many Houses were Burnt, Inhabitants destroyed, Vine-yards and Gardens quite defaced. But whence come so many Flames under the Earth? From the dry Vapours which being so closely press'd in the Earth, and from several motions and agitations in it, Fire doth necessarily Kindle: For Fire, says *Aristotle*, is high ed smoke. About the year 1541 Fire broke out of a Fountain named *Eliseum. Gregor. Agricola de ijsquæ effluunt è terra lib.* 4. *pag.* 152. And *Strabo* Writes, that so great Fire issued out of the Earth, that some Towns were consumed, and among them *Sodom* at the Lake *Asphaltites:* But we are taught better by *Moses* in his sacred History. Moreover as our Fire when 'tis shut in, is moved up and down by a various Reciprocation, some doubt not but subterraneous Fire is diversly excited, and sometimes flies downwards into the most profound Cavernes, and sometimes upwards, towards the highest Parts of the Earth, as the Earth is variously changed and disposed by Heaven and the Air.

57. And these I take to be the second Causes of that Spirit which lately shook the Earth so swiftly and so deeply, which yet could not likely produce so unusual an Earthquake, by its Natural Power alone.

58. To which was added that chief and first Cause, God, who by an extraordinary way of acting, wonderfully encreased the strength of that Spiritus generated within the Earth, and added one degree of force to it beyond its own Power, which Nature could not add, so that this Earthquake may be reckoned not purely Natural, but mixt with both, as we asserted before. For all Miracles

racles do not exclude Nature, but many include it, ſo that they increaſe its force and vertue, and extend it to that degree, to which it could not attain unleſs the Almighty Power of God were ſuperadded. The Scripture doth propoſe unto us an evident Example of it in *Sampſon*, whoſe prodigious ſtrength by his bodily Temper, and all his Sinews and Muſcles were ſo exceedingly ſtrong; However God himſelf did reinforce and increaſe them ſo much that he could rent into pieces a young roaring Lion like a Kid, *Judg.* 14. 7. that he could break the ſtrongeſt Cords like a Linnen-thread or Flax; that he could ſlay a Thouſand Men, with the Jaw of an Aſs, *Judg.* 15. That he could take the Doors of the Gates of the City, and the two Poſts, and carry them upon his Shoulders to the top of an Hill, *Judg.* 16. So the Divine Power of God did increaſe the natural ſtrength of *David*, that he could overthrow this prodigious and *Stronglimed body Goliah* with a Sling only. 1 *Samuel* 17. To the ſame kind of Miracle we may refer the Example of *Elijah*. 1 *King.* 19. where it is ſaid, that having eat a Cake and drank Water out of a Cruiſe, he was ſo ſuſtained, that in the ſtrength of that Meat he went forty days and forty nights unto *Horeb*, *the Mount of God*. There are evidences enough throughout all the Doctrines of Divines concerning the variety of Miracles, their many ſorts and their ends to ſhew that theſe ſtrengthning and reinforcing of Natural Faculties, though ſupplied by God; may fall out alſo on our Ages, as we have obſerved in a few words before in the nineteenth *Theorem*.

CHAP. III.

Of the Effects and Preſages.

59. ALthough thoſe things which happen contrary to Nature, have not an end properly and perſe out of Nature, yet they have their effects preſages, and portenta, When Earthquake happens beſides its Nature, it cannot have an end properly, and perſe in reſpect of the Earth. For the end of every thing is according to its

Nature, 2. *Phyſ.* 3. But in reſpect of the Vapours or Spiritus by which the Earth is moved, this end is aſſigned by Naturaliſts, that the nature of that Spiritus may be preſerved whilſt ſallying out of the Earth, it aſcends into the open Air, making its own way out of the Caverns of the Earth, in which it was included as in its Priſon, ſo gaining a place proper and agreablee to its own Nature.

60. And ſeeing this Earthquake is mixed with Nature and Miracle, it hath Natural effects, and alſo its Preſages from the ſupernatural Ordination of God.

61. The effects will be as is the Cauſe, to wit, Præternatural, that is contrary to Nature.

62. Three of which effects are more eſpecially to be feared, which both the Nature of Earthquakes, and Experience, and the Obſervation of Examples do evince, to wit, Sickneſs, Inundations, and Sterility.

63. Earthquakes cauſe Epidemical and Contagious Diſtempers, becauſe the Vapours in the Caverns of the Earth either contract rottenneſs or ſome venemous qualities (eſpecially if ſhut up in it for any conſiderable time) and thence ſallying out, they make impreſſions in the Air that ſurrounds us, which when drawn into our Bodies by breathing, there muſt needs be impreſſed the like qualities in the inmoſt Bowels of our Bodies; Neither do they only infect the Air, but alſo the Water without which we cannot be. That the quality of ſubterraneous Vapours is very prejudiciable to our Health, is teſtified by experience in thoſe places where the Earth abounding with Minerals, ſends into the Air frequent Exhalations, but eſpecially if the Earth be porous and looſe. Neither need we go very far for Examples: Thoſe Caverns which are at the Sharp, and the Fountains of *Schwalbuh* may teſtifie it, which are ſo much infeſted with venemous Exhaltations, that Dogs or Hens carried into them, die ſooner than any one can imagine. *Geor. Agric.* hath Writ accurately *lib.* 2. *de nat. rer. è terra effluent.* When at the beginning of the Book he Writes, the Air which is ſhut up a long time in any Concavity of the Earth, rots and is made peſtilent: And a litte after; there are in many places of the Earth ſcrobes, exhaling mortiferous Vapours, but no where more then in *Italy*, &c. *Cardanus* alſo in the Appendix of his Work *de Rerum varietate*, explains the thing by ſome Hiſtories and Examples. Moreover the Hiſtory of all Times teacheth us what grievous and peſtilent Diſtempers have been cauſed by Earthquakes. *Seneca lib.* 6. *quæſt. natu.* atteſts that a Flock of 600 Sheep was deſtroyed by an Earthquake in the

the Province called *Pompeia*. Sheep being of a very ſoft nature and carry their heads near the Ground. In the 19*th*. years from the building of *Rome*, after an Earthquake, followed a Plague, which laſting three years, there died at *Rome* 300000 men. So in the year of our Lord 748. after an Earthquake in *Paleſtine* a great Sickneſs was prevalent in *Sicily*, *Greece*, and *Thrace*.

And in the year 801. when *Charles* the Great was inveſted with the Empire, Upper *Germany* was infeſted with a vehement Earthquake, but eſpecially the Coaſt of the *Rhine*, which was followed by a Peſtilence, which dreadfully afflicted *Germany* and other Places. *Stump. lib.* 4. *cap.* 21. So in the year 1309. on the Feaſt of the Converſion of St. *Paul*, all *Germany* ſhook, and the Plague afterwards raged throughout the Country, ſo that 600000 men are reported to have died at *Florence* and 90000 at *Lubeck*. That God the Father of all Mercy would grant, that no ſuch conſequence may happen from our late Earthquake, and that the Epidemical Diſeaſe which now infeſt theſe Places, ſo near to a kind of a putrid and malignant Feaver may not be converted into a more dangerous Diſtemper. The unlucky Eclipſes and Poſitions of the heavenly Bodies this years portend ſome ſuch things in other Countries. The *Northern* Latitude of *Saturn* in the Sign of *Scorpius*; and thoſe four Eclipſes of the foregoing year, two of which happened in the Month of *June*, whereof that of the Sun was a ſtupendious one for its Magnitude, will exert their Operations this year as the Maſters do reckon.

But that the Waters are alſo polluted by thoſe Vapours is known by the Fountains, which both before and after Earthquakes are wont to be impurer and thicker. Which is alſo atteſted by *Pliny*, *lib.* 2. *cap.* 81. where, *he ſays*, The Water in Wells is thicker and not without a loath ſome ſmell, which odour is Sulphureous and metalline, from whence one may certainly conclude that ſome Vapours ſallying out of the Earth, have mingled themſelves with the Water. Hence it is, that *Pherecydes Pythagoras* his Maſter foretold an Earthquake by drawing ſome Water out of a Well, concerning which *Pliny* Writes, as by ſome Divine Preſage, *lib.* 2. *cap.* 29. Which *Cicero* mentions 1. *de Divinat. Geor. Agricol. lib.* 4. *de efflu. è terr. pag.* 153. think that muddy Water in Wells is moſt commonly a Sign of an Earthquake already begun, and he believes that no proper and certain Sign of future Earthquake can be aſſigned, for thoſe that are delivered by Writers are either the Sign of an

Earthquake just begun, or its Modus; so that they may happen without a future Earthquake.

64. Overflowing of the Earth are therefore wont to ensue Earthquakes, because the Exhaltations violently sallying out of the Earth, break the Veins and Caverns wherein the subterraneous Waters are shut up, so that Water is in a more abundant manner driven into the Veins and Springs of Fountains and Rivers.

This is confirmed by *Aristotle*, 2. *Meteor. cap.* 8. Exhalations breaking forth with great Force, carry along with them whatsoever Water there is in their way; and he adds in the same place, that the Winds that blow the contrary way are the Cause of it, because the Spiritus shaking the *Earth*, it cannot repel the Sea brought against it by another Wind. Examples also observed in History, prove the same. For *Procopius*, *lib.* 3. *de bello Gothorum*, *pag.* 383. describes the unusual Inundation of *Egypt*, as arising from an Earthquake. About that time a great Earthquake happened which shook all *Bœotia* and *Achaia* and the other places, about the *Sinus Creseus*, and also an infinite number of other places and levelled eight Cities to the Ground. And the Earth in some places when it had gaped extreamly, came again to its former state, but in other places it remained so much cleft, that the People of that Country were forced to make a large Circuit to converse with one another. But in the narrow Sea between *Thessaly* and *Bœotia* there arose so great a Commotion and so great an Inundation, that great desolation was made both of Mountains, Edifices, and Men. In the second year of the Reign of *Flav. Valentiniam* and *Valens*, the Sea so swelled that overflowing *Sicily*, it Buried in its Waves several Towns and Villages. In the year 1508. an Earthquake was followed most grievous Inundations throughout all *Italy* and *Germany*. And wish we might take example and experiment of that calamity from the late Earthquake, that we might be brought to repentance.

In the same place 'tis said, 'We have news daily of the most pernicious Inundations through the Dutchy of *Juliers* and *Claves*, and 'the Oriental *Friezland*. We have been eye Witnesses of the unusual increasing of the River *Neker*, which overflowed in *December* and *January*, with a considerable damage.

How the *Rhine* hath overflowed, the Inhabitants know to their own sorrow and loss, where that unusual Inundation proceeding from the River and Rivulets in *December*, between *Strasbourg* and *Spires*, as it was fatal to several persons, so among the rest to the head of an Ancient Family.

65. *Lastly*,

65. *Laſtly*, Barrenneſs is the conſequent of an Earthquake, becauſe of the envenomed Vapours which while they permeate the pores of the Earth, leave behind them their Venemous Footſteps, and imprint their Qualities both on the Earth it ſelf, and alſo in the Seed, whereby the enlivening Power fit for the production of Corn is corrupted. Wonderful and different were the Sentiments of the common ſort of People after the late Earthquake, as is uſual; and Husband-men were every where heard interpreting this Earthquake as a Joyful Omen of a ſingular future Fertility. But this Conjecture is eaſily refuted by the conſideration of Natural Cauſes, eſpecially ſince Hiſtory atteſts the contrary. For in the Year 315. from the building of *Rome*, ſo great a Scarcity and Barrenneſs followed an Earthquake, that *Livy* mentions it as remarkable that many threw themſelves into *Tiber*, where they made at one another to devour themſelves. In the Year of our Lord 542. an univerſal and moſt grievous Famine enſued upon an Earthquake, that was it ſelf almoſt univerſal, as ſays *Paul Diaconus*, *lib.* 16. The ſame happened in the Year 1326. and again in 1033. But as a Plague and Inundation do not follow an Earthquake ἀναγκαίως but ὡς ἐπὶ τὸ πολὺ ſo neither do Barrenneſs and Famine: For as the Subterraneous Spirits are not always equally diſpoſed, ſo ſometimes they are leſs envenomed and deſtructful and more ſubtil, that they exhale ſooner, neither do they ſo eaſily imprint on the Ground any quality noxious to the Fruit, which that we may experience in this Earthquake the next Harveſt, let him alone who is able to crown the Year with his Bleſſing grant.

66. And as this Earthquake was not only natural, but of kind to a miraculous one, ſo alſo ſeems to contain in it the Preſages and Portenta of ſome wonderful and extraordinary Changes among Mankind. I ſaid before that God added a Supernatural force and degree to the Natural Cauſes of this Earthquake. And God doth nothing in vain, but direct all to ſome certain end and ſcope, ſo that 'tis neceſſary ſomething ſhould be in this Earthquake more than could proceed from the power of Nature alone.

67. But as Comets do not of themſelves and their own nature cauſe or denounce any Change in Kingdoms, and any other Humane Affairs, ſo neither do Earthquakes; but ſuch events happen in theſe wonderful and ſecret Works of Nature from the diſpoſal and Ordinations of God, partly exciting Mens Minds and preparing them, partly terrifying them with thoſe fear of Futurities. The Rainbow of its own Nature can neither be a ſurety for, nor con-

firm

firm the Grace and Covenant of God to the World, that there ſhall be no more an univerſal Flood, but it doth engage for, and confirm it by a ſupernatural Revelation, which the gracious Counſel of God impoſed on this work of Nature. The ſame muſt be determined of Earthquakes, Comets, Chaſms and other wonderful Meteors in Nature.

68. But what change in *Europe* doth this Earthquake preſage? This neither I nor any body elſe can eaſily tell. He alone knows who endowed the Earthquake with the ſignification of Futurities, who encreaſed and augmented the Power of Nature; and laſtly who hath at his own diſpoſe, both the Cauſes and their Effects.

69. The Scripture, as far I could obſerve, ſpeaks of Earthquakes after a three fold manner.

70. Sometimes as of the Sign and Symbol of the preſent Grace of God already held forth. As was that Earthquake by which the Apoſtles and other Members of the Primitive Church were confirmed againſt the intermediate Aſſaults of their Enemies, by the hearing and the preſence of God from Heaven, of which *Acts* 4. v. 31. *But when they had prayed*, ſays *Luke*, *the place in which they were Aſſembl d was ſhaken, and they were all filled with the Holy Ghoſt.* To which is to be referred that Earthquake that happened at the Reſurrection of Chriſt, the Angel of the Lord deſcending from Heaven, and Rowling away the Stone from the mouth of the Sepulchre, of which, *Matt. cap.* 98. verſ. 2. makes mention. To the number of theſe Earthquakes doth alſo belong that which is mentioned, *Acts* 16. verſ. 16. *But in the middle of the night*, Paul *and* Silas *were Praying and Singing of Pſalms, when on a ſudden there was a great Earthquake, ſo that the Foundations of the Priſon were ſhaken, and the Doors were oppened, and all their bonds were looſed.*

71. But as ſuch Earthquakes are ſeldom, ſo they are meerly Miraculous: and ſuch Examples are not eaſily to be found either in the Hiſtory of our own or former Times: For the Sins of Men deſerve otherwiſe.

72. But the Scripture often ſpeaks of an Earthquake as of the Meſſenger and Witneſs of the Divine Wrath, and the preſage of Puniſhment to certain Kingdoms and Provinces for the Publick and Private Sins of the eminent Ones. The Scripture ſcarcely ever ſpeaks more frequently of any preſage of the Wrath of God and impending Puniſhments, than of an Earthquake, as the 2*d.* of

Sam.

Sam. 22. verſ. 8. *Pſalm.* 18. verſ. 8. *The Earth is ſhaken and moved, becauſe his Wrath is Kindled.* Job 9. *verſ.* 5, 6. *Who removes Mountains, ſo as he is not obſerved; who overturns them in his Wrath, who moves the Earth out of its place; So that the Pillars thereof ſhake.* So Eccleſ. 39 32. *There are Winds created for puniſhment, in the conſummated time they pour out the ſtrength and fury of him that made them.* And the like places in *Joel* 2. 1. *Na.* 1. 5. *Amos* 1. 1. *Zac.* 14. *Numb.* 16. 21. And God was pleaſed to promulgate his Laws by an Earthquake, *Exod.* 19. 18. That he might teſtifie that, that puniſhment was ready for the breakers of them. To which muſt be referr'd that Earthquake which happened whilſt Chriſt ſuffered, *Matt.* 27. 51. *The Earth*, ſays he, *was moved, and the Rocks were ſplit; which was alſo a Teſtimony of Chriſt's Innocence. John* in the *Revela.* denouncing the Wrath of God and the puniſhments which are to be poured forth on the later days, makes often mention of an Earthquake, *cap.* 6. 12. *Cap.* 8. 6. *cap.* 2. 13. *There was*, ſays he, *in that hour a great Earthquake, and the tenth part of the World fell, and there were kill'd in the Earthquake* 7000 *men, and the reſt was terrified and gave Glory to the God of Heaven.* cap. 16. 18. *There was a great Earthquake, ſuch as never was ſince Men were on the Earth, an Earthquake*, ſays he, *ſo great.* Which ſayings although they have an Allegorical interpretation, yet they may be taken properly; or at leaſt they will lead us to this, that the Scripture doth commonly repreſent deſtructful puniſhments and calamities by an Earthquake.

73. For nothing ſeems to be a greater puniſhment and calamity to Mankind, than an Earthquake.

74. For all other fatal puniſhments are wont to enſue upon an Earthquake, and we may ſooner foreſee War, Famine, and Peſtilence, and ſo take heed of, and avoid them by preparing proper Remedies, than we can foreſee avoid and fly from an Earthquake: ſeeing the Spiritus in the Earth is not reſtrained by any Humane force, neither can we fly away from the Earth. Hence it is that Experience witneſſeth, that Brute Beaſts and Men are terrified by nothing ſo much as by an Earthquakes; ſo we ſee that even the moſt ſavage and cruel Hearts of Tyrants, that have their minds hardened moſt againſt God and Men, have been terrified by Earthquakes. There is extant in *Joſephus*, a memorable paſſage concerning this, *lib.* 1. *de bell. Jud. cap.* 14. *and lib.* 15. *Antiq. Jud.* Where *Herod* a deſpiſer of God and Men, thus Speaks to his Army. *Let not the Fear of*

inanimate

inanimate things at all terrifie you, nor imagine that Earthquake is an omen of future deſtruction; for the defects of the Elements themſelves are Natural, and infer no other loſs than, that which they cauſe; ſo that when they do happen, they are ended by their own greatneſs. Theſe Prophane Speeches did the Tyrant then utter, whilſt he himſelf was ſo aſtoniſhed in his own Mind, that he offered Sacrifice for the appeaſing of God, as *Joſephus* mentions in the ſame place. The Heathens being always terrified by Earthquakes, began then in earneſt to think of appeaſing God, and rightly of inſtituting their Sacrifices. Hence it is, that *Pliny* ſaith, *lib.* 2. *cap.* 84. For there is not only in an Earthquake ſome ſimple evil and danger, but an equal or greater Omen of ſomething to come. The City of *Rome* never trembled (yet it ſhook in the year 537. about fifty ſeven times) but it was the Omen of ſome future Event. Therefore that impious ſaying of *Seneca* is repugnant to the Senſe and Conſcience of Mankind. 'The Gods do nothing of theſe things, neither is the Heaven or the Earth ſhaken by the anger of the Deities. So *Gellius*, *lib.* 2. *cap* 28. What is the Cauſe of Earthquake, is not yet manifeſt: Therefore the Ancient *Romans*, when they either perceived or were told that the Earth ſhook, commanded by their Edits that Holydays ſhould be kept, but in the publiſhing of them did not name the God as is uſual, for whom the ſame were to be kept, and *Marcus Varro*, ſays, 'twas ſo obſerved by the Decree of the Prieſts, becauſe 'twas uncertain whether the Earth trembled by the Power of the Gods or Goddeſſes. There is extant in *Roſinus*, the Hiſtory of ſome Superſtitious expiation, *lib.* 4. *pag.* 66 where he ſays, *That grievous Earthquakes enſued upon the Death of* Valentinian. *Crete* was vehemently ſhaken with all *Peloponneſus* and the reſt of *Greece*, except *Athens* and the Country thereof, which they ſay, was ſaved by this means. *Neſtorius* the High Prieſt ſaw in a Dream the *Athenians* adviſ'd to prefer the Hero *Achilles* to the higheſt Honnours, for this would be moſt advantagious; he therefore being taught by Divine Speculations, after having performed a ſolemn Sacrifice, plac'd the Image of the *Hero* under *Minerva*'s, ſo was *Athens* and all its Land free from the Earthquake. There is a parallel place in *Syneſius Cyre. Epiſ.* 61. of Devotion in the time of Earthquakes. God often (*ſays he*) 'cauſed 'an Earthquake in the day time, and Men ſtood commonly upright 'whilſt they pray'd, for the Ground was ſhaken wherefore thinking 'the Sea was more ſeverely ſhaken than the Land, I ran to the Heaven, *&c.* But the Chriſtians of the Primitive Church us'd not to fly to

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any unkown God, but to the true one that shakes the Earth and implored his Grace and Mercy; an Example of which pious Custom is related by *Justinian* the Emperour, who when he heard that *Antiochia* was shaken by a grievous Earthquake, in which a great number of Men had perished, presently laid down his Diadem and Imperial Robes, and put Sackcloth, and published an Edict whereby he commanded his subjects to Fast and Pray for many days, and to do all other things, which testifie a serious repentance. *Sozomenus, lib. 6. cap. 2. Stump, lib. 7. cap. 28.*

There is extant also an Epistle of *Marcus Aurelius Antoninus* to the People of *Asia*, wherein he exhorts them not to lay the Fault of the Earthquake upon the Christians, but rather religiously to invoke after their fashion the Author of the Earthquake; 'It will not be ab-'sur'd, continues he, to comfort your sorrow by a just warning, for 'I have found out that in such occasions you do ascribe these ordinary 'Events to some motive of envy, that the God, whom they trust 'much to, may have; and whilst that you know not the Reasons thereof, you do neglect every time the Worship of the other Gods, and so you endeavour to put away and cast down the Worship of the immortal God, whom the Christians do adore.

And there is no doubt but that many pious Men every where through *Germany* and other Cancrys, devoutly and religiously followed that pious Custom of the Ancient Church, and stirr'd up themselves to serious Repentance and ardent invoking of God's name: which effect if it hath not happened in all, yet the thoughts of the Evils which have in all Ages ensued upon the Earthquakes, ought still to stir them up and awaken them to true repentance, seeing those effects have been observed by the most severe Writers of Earthquakes. For it is not rash to say that commotions of the mind follow an Earthquake, as a Shadow the Body. Neither does it want its natural Causes, for 'tis certain that the Air we draw in, have several change of alterations by Earthquakes, and the Temperament, and so the manners of Men are much affected with the temperateness or intemperatness of the Air, and they are disposed by it, if we believe the most skilful Physicians, and our own experience. Histories are full of Examples, of which I will instance but one or two. *Delos* trembled about the time of the *Peloponnesian* War (which was called immoveable by *Pindar*, as *Seneca* relate out of *Callisthenes, lib. 5. Nat. quæst.*) Whilst *Brennus* was attacking the *Delphian* Temple, there happened so great an Earthquake, and so great a Tempest mingled with Hail and Rain,

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that the *Gaulois* Army were almost overwhelmed. Earthquakes happened often in the *Carthaginian* War, so that 'twas said at *Rome*, an Earthquake happened 57 times in the same year, in which the *Romans* and the *Carthagians* fighting at the Lake *Trasimenian*, were neither of them sensible of a great Earthquake which was there, *Plin. lib. 2. cap. 4.* and in the 83. he says, *That two Mountains ran against one another, rising and retiring with a great noise, by which concourse all the Towns were dash'd to peices and Cattle between kill'd*, which was in the year before the *Social* War, and says he, *I know not but it may be more fatal to* Italy, *than the War.*

In the year of our Lord 369. many Earthquakes happened every where which where followed by a most severe Persecution under the Emperour *Valentinian*, as is attested by *Hierome* and *Eusebius*. In the year 455. a remarkable Earthquake preceded those dreadful devastations of the Country of *Attila*, as is Witnessed among others by *Stumpf. lib. 4. cap. 34.* So in the year 841. *Herbipolis* shook about twenty times, upon which a bloody War ensued between the Emperour *Lotharin*, and his Brother. So in the year 1171. a War broke out between the *French* and *Swedes*, when several Earthquakes had preceded it every where through *Germany*. So in the same year 1171. a great War arose between the Emperour *Friderick* the I. and Pope *Alexander* the III. In the year 1372. on the first of *June*, a dreadful Earthquake shook *Germany*, and a little after ensued a grievous War in *Bavaria* and *Swedland*. Also in the year 1384. on *Christmas-Eve*, the Earthquake shook, and a little after ensued the dreadful War of *Leopol* with the *Switzers*, which was both destruction to the House of *Austria*, and fatal to the Young Prince *Leopold*. In the ye r 1521. before *Belgrade* was taken by the *Turks*, the Neighbourhood shook for 3 days together, and many Houses fell down every where. I cannot but set down the Words of a wise old Man, *Gaspar Peucer*, which are extant in his Commentary of Divinations, *pag.* 389. 'The Mountains of *Suda* and the Towns built 'there felt. Not only one or two, but continual shakings of the Earth '(which says History always denounce great Wars and destructive Se-'ditions) the Houses shaking as if it proceeded from the diffused im-'pulse of Winds. These things undoubtedly threaten dreadful destruction and calamities, which I pray God mercifully mitigate for the sake of his Church, and spare the innocent and guiltless Ages for the sake of his Eternal Son Jesus Christ. But there is another Example fresher in our Memory, *viz.* of the year 1590. when some parts

of

of *Germany*, especially *Austria*, *Bavaria*, and *Misnia* were shaken, which Earthquake is the more remarkable and worthy to be compared with the late one, because it happened almost at the same time, *viz.* on 5*th.* of *September*, and because a little after the *Turkish* War grew more outragious in *Hungary*. And lastly, because a little after, as it were the three supporters of *Germany* fell down. First in the same Month the Earthquake was, *viz.* *September* the 25*th.* *Christian* the Elector of *Saxony* died, and 'tis still fresh in the History what disturbances ensued upon it, in the *Saxon* and *Misnani* Churches. Not many months after *John Casimir* the Administrator and Tutor of the Elector *Palatin* died, who came behind none of the most Valiant Heroes. And Lastly, *William* the *Lantgrave* of *Hesse*. The loss of which three Princes in so short a time, all prudent Men thought ominous to *Germany*, as they do still, for that *Germany* seem not yet either to have shunn'd or overcome that Omen. Neither shall I here mention those Wars which *Mosobus* again in the same year stirred up in *Livland* and *Sweedland*, nor the death of those Eminent Men *Francis Hottoman*, *Cujacius*, and some others, nor that which happened in *France*, the Siege of *Paris*, which continued for many months together; neither will I mention that two years afterwards, *viz.* in 92, seven other *German* Princes besides *Casimir* of Excellent Memory, were taken out of this World, and that a War arose between the two Elect Bishops of *Lubert*, while the Canons disagreed about it; and that in the same year, *Clement* VIII. was chosen Pope, who was formidable for his craft and cunning. Which things seeing they are all thus experienced, let us stir up our minds to serious and fervent Prayers, and to the Observation of the ominous Omens of the last Earthquake, and while we are deprecating the Portents, let us prepare our selves for future Evils and the fatal change of *Europe*, foretold us by this Earthquake, and foreseen by Wise Men. For it is possible either to shun decreed misfortunes either publick or private, or to render them more mild by piety, reason, the remedies applied from Counsel, and by opposing good contrary to those Evils. But let us consider that there are two sorts of Motions in the Spirit of Mankind. There are some motions in the good Spirits, and some in the ill-natured and wicked ones. And as it happeneth that the ill-natured Spirits do stir themselves for the ruine and destruction of the best setled and ordered Kingdoms and Empires. So it happeneth often that God stirs up some profitable and convenient Motions in the Spirits of the greatest Princes, or

in the Republicks, wherewith all the evil design; and machinations of the wicked are happely broken, and a good Peace and Tranquillity is procured as well to these Kingdoms, as to the Church. To which we may refer this great Revolution lately happened in this Kingdom of *England*.

A little before this Earthquake which happened in *France*, in 1601. the *Dauphine Lewis* the XIII. was born in that Kingdom, and at the very hour of it the late Elector *Palatin* had his Son born.

It is commonly said, that motions of Heroick-souls are great and easie. Neither is History defective in Examples of the Birth of great Heroes and Princes born just at the time, when there were Earthquakes. Writers, says *Hercules*, was born whileſt the Earth was shaking, although I am not ignorant what credit is to be given to the History of *Hercules*; yet this is apparent from the Relation, that the Ancients thought that an Earthquake was an Omen and Presage of a great and Heroick-soul in those whose birth happened at the same time. But there are other Examples of Earthquakes extant in History, by which God hath (as by a portentum) attested his wrath against the enemies of the Righteous, and his favour to the Godly, by some joyful Omen. *Theodorus*, *lib.* 5. Hist. *cap.* 34. about the year 402. mentions, that *Chrysostome* was banished by the Emperour *Arcadius*, but the first Night after his departure, the Emperours Palace was shaken by some terrible an Earthquake, that being frightned by that prodigy, he sent Messengers after him, and honourably received him, whom he had ignominiously thrust out. And *Russinus*, *lib.* 1. *cap.* 28. Writes that *Julian* and Jews were terrified from repairing the Temple at *Jerusalem* by a dreadful Earthquake, which they were earnestly endeavouring to effect before, out of hatred and ignominy to Christ. So God discovered his anger against *Diocletian* the Cruel Persecutor of the Christians, by an Earthquake, in which many thousand Men perished. *Theod. lib.* 2. Hist. *cap.* 26. when a Councel was held at *Antioch*, where the Decrees of the *Nicen* Synod and *Athanasius* were condemned by *Arrians*, not long after ensued a most grievous Earthquake, which lasting a whole year, was very destructive to *Antioch*. *Anno* 347. related by the *Tripar.* Hist. *lib.* 4. *cap.* 15. *Evagrius lib* 2. *cap.* 12. *Funccius* in the year 344. and memorable in that which *Eutropius* notes about the time the *Arrian* Heresie and Tyranny spread through the *East*, that there were frequent Earthquakes, and that those places shook grievously. Neither is that which the same Author relates less remarkable, that presently after the

Death

Death of the Apoſtles *Paul*, *Laodicea*, and *Coloſſus* were ſwallowed up by an Earthquake, ſo that the puniſhement of thoſe that contemned the Doctrine of *Paul*, might be conſpicuous. And I ſeem not to have ſpoken raſhly, when I ſaid that no puniſhment or calamity is more grievous than an Earthquake, ſeeing 'tis an evil that can neither before ſeen, nor eaſily averted by any Remedies. *Pliny. lib.* 2. *cap.* 82. preſcribes two Remedies againſt Earthquakes, *viz.* to dig many holes in the Earth, and make many paſſages there; but this is both labourious and almoſt as dangerous to Cities and Towns, as an Earthquake. But perhaps ſome body will ſay, we ſhall be ſafe in Rivers againſt Earthquakes. I confeſs there is ſome ſafety in Rivers, and *Synecius* whom I cited before, Writ is that in a great Earthquake; he thought the Sea more ſecure than the Land; but that doth not want its dangers neither; for the bottoms of Rivers are obnoxious to Earthquakes, as we ſhall ſhew in our Problems, and the Earth may eaſily gape under the Water or ſome heap of Earth plunged into the River from the Neighbouring ſhore, may overwhelm us, and ſometimes Rivers us'd to be dried by Earthquakes, ſo that they that ſeek ſafety in the Rivers againſt an Earthquake, may find their Death and Grave. But I cannot conjecture what ſhould be the meaning of that which *Agathias*, *lib.* 5. ſays, is the true Platonic Opinions, that he that periſhed by an Earthquake is to be eſteemed more happy than he that ſaved from it. For if an Earthquake be a moſt grievous puniſhment, which the Scripture atteſts, he cannot be happy who is involved in an Evil, grievous in it ſelf, and terrible to all Mankind.

75. *Laſtly*, The Scripture ſpeaks of an Earthquake as of a Sign or the forerunner of the laſt decretorial Judgment, at which a little before the end of the World, that great Judge will appear with the Angels of his Power, who himſelf, ſay *Luke* 21. 11. That there will be great Earthquakes in every place before his coming; And *Matth.* 24. 7. He makes uſe of almoſt the ſame Words. The Propheſies of future Signs, reſpects both the deſtruction of the Temple and City of *Jeruſalem*, and the end of the World. Therefore that which is aſſerted of great Earthquakes, may be accommodated to both thoſe times. For *Joſephus* diligently obſerves how great Earthquakes preceded the laſt ſacking of *Jeruſalem*.

76. Of this ſorts of σεισμοὶ μεγάλοι good Men think that was, of which we are now treating, by which the Son of God in this laſt Age of the World, would warn and excite Mens minds, that they might

might ſeriouſly and timely prepare themſelves for the great Seſſions, and hear that Sentence either of Eternal Life or Death, never to be revoked. I ſee no reaſon why we ſhould doubt that ſome Signs nearer and greater forerunners of the coming of Chriſt to Judgment than others. And therefore although this Earthquake be to be numbred among thoſe Signs, as the ingenious and learn'd Mr. *Beverly* elegantly inſinuates, yet 'tis likely there will be ſome other Earthquake more terrible, meerly miraculous and nearer the Day of Judgment. Which he may be applied to other Signs, as darkning of the Sun and Moon, may be gathered from 24 of *Matth.* and 21 of *Luke*, and from *Acts* 2. 19. where *Peter* cites that of *Joel*, *I will give Miracles in Heaven above, and Signs in the Earth below; Blood, and Fire, and the Vapour of the Smoak. The Sun ſhall be changed into Darkneſs, and the Moon into Blood, before that great and glorious Day of the Lord come*, &c.. *Thou Lord Jeſus come, come quickly, or if it ſeems good to thee to delay, grant that while the Earth ſhakes and Hell rages, while Kingdoms, Empires, and Kings are ſhaken and daſhed one againſt the other; the Church, thy little Flock may enjoy, at leaſt a moderate quiet and reſt both here in* England, *and throughout the whole World.* Amen.

CHAP. IV.

Of the likeneſs or unlikeneſs of theſe two Earthquakes.

77. IT remaineth now, that we may examine, in what theſe two Earthquakes do agree, and in what they do differ, as well in their Forms and Cauſes, as in their Effects.

As to the Form, 'tis ſaid in the 15*th. Theorem*, that the firſt was partly trembling and partly pulſative, according to the diverſity of the plainneſs or unplainneſs of the Fields. But all do agree, that this laſt was ſome kind of panting or brandiſhing Motion, for the Earth was ſhaken laterally according to its Latitude; now that don't befall ſo in the Pulſe or Vibration; and that ſort of Earthquake is more frequent. Upon the laſting of the firſt all Authors do not agree: But as to this laſt, 'tis Witneſſed from

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all places, that it did last two Minutes. I will only mention these words of Mr. *Edward d'Auvergne*, Chaplain to my Lord *John Bathe*, Governour of the Cittadel of *Plimouth*, in his Relation of the most remarkable Transactions of the last Campaign, in the Confederate Arms, where he was, pag. 61. *We felt an Earthquake*, says he, *which lasted about two Minutes, and shook the Earth very violently. It was felt at the same time all over* Flanders, *in many parts of* England *and* France, *and in other places of* Europe, *we had it about two of the Clock: It caused a great Consternation in our new Garison of* Dixmuyde; *some thinking at first that the* French *had undermined several parts of the Town, and were in Ambuscades, going to blow them up.*

78. We may observe among the other Conformities of these two Earthquakes, these two chiefly; the Conformity of the Month; and the Conformity of the Day. Nay, we should make some consideration of the Time on the Day on both, to wit, that the first happened at two of the Clock in the Morning, the last at two of the Clock in the Afternoon, so 'tis only the Intercalation of 12 hours; which Event is remarkable enough. But now in regard of the Conformity of the Month: We have observed in the 45 *Theorem*, that amongst the Planets, the Efficacy of *Saturn* did prevail that year. The same is happened this last year; as 'tis clear by the Observations of Mr. *John Partridge*, that famous Mathematician, upon the Month of *September*: He says so, the Month of *September* begins with Quartile of *Saturn* and *Venus*. The Trine *Jupiter* and *Mercury* with a wet and windy Air. 2dly. 'Tis observed in the 46 and 47 *Theorems*, that the Power of the three superious Planets, *Saturn*, *Jupiter* and *Mars*, is the most eminent in producing Earthquakes. Besides 'tis constantly affirmed, that the last Earthquake happened when the Sun was in *Virgo*. So were all these things disposed at the time of this last Earthquake. These are the very words of our forementioned Mathematician: *All the mutual Aspects of the Planets in this Month are* Sol *and* Virgo, Luna *and* Libra, Saturnus *and* Sagittarius, Jupiter *and* Gemini, Mars *in* Libra, Venus *in* Virgo, Mercurius *in* Libra, Cancer, *in* Libra. *At last he doth conclude thus: The Observations upon that Month. The Quartile of the Sun and* Saturn, *and the* Sun *and* Jupiter, *will in some measure influence* September *also*, &c. To which we may joyn, the Temper of the Air in that very Month; whose first part was warm and wet by turns, but the most part warm and windy; so if we confer these things with what is said in the 52 and-

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53 *Theo-*

53 *Theorems*, we shall see that the Dispositions of the Air were the same, to wit, rainy Wheather in the *Dog-days*. There was also a very high *South-west* wind in that Month, tho 'tis true that the Air was calm enough that very day when the Earth was shaken. *Lastly*, As these two Earthquakes had their Conformities in their Causes, so had they in their Effects, though not in such a high degree. 'Tis observed that there are three Effects proceeding from Earthquakes. 1. Universal Sickness. 2. Overflowing of Rivers. 3. Scarcity of Fruit or Barrenness. As to the first, we did hear from many parts of *France* and *Italy*, that some Malignant Feaver did appear, and 'twas reported that some kind of Plague hath been discovered in the Province of *Languedoc*. We must adore the Divine Providence, who hath kept this Kingdom from all these Mischiefs, wherein it was involved by so many Sicknesses, when the first Earthquake happened, in the last year of Queen *Elizabeth*'s Reign. But as to the overflowing of Rivers, we had lately too many proofs of this effect; so that I need not to enlarge in the recital of many particular mischances that happened in many places almost overwhelmed, where several Persons have been lost by the Flood.

We should now come to examine the third effect of Earthquakes in reference to the first, that is the scarcity and barrenness. But we leave it to be felt and proved in *France*, where we know it is great. And though all sorts of Provisions are grown so dear since the Month of *December* last, in this Kingdom, and especially in *London*, yet that cannot be call'd scarcity; every one knows well enough the difference between dearness and scarcity. The continuance of bad Weather may always cause the same effect without any former Earthquake. We hope then that the same Divine Mercy which has preserved this Kingdom, and gathered therein so many thousands of Foreign Souls, and provided them with Bread seven years long by Miracle, will continue to send the same Blessings of Plenty unto this Nation, who hath pitied his distracted People. The past Events being a kind of Security for the [illegible]. Whereupon we must [illegible] God will spare these Islands, where the Candlestick of his Gospel hath been kept fast against all the Attempts of Popery. And so we conclude that the seven past [illegible] Plenty [illegible] enough to put us in mind of the extraordinary and [illegible] Providence of God for our Relief in a strange Land. [illegible] also that his design hath been to warn us by this present dearness, to be wary afterward, and to turn our selves from any abusing profuse-

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neſs of his Graces; otherwiſe the Bread ſtaff of ſhall certainly be broken, it will be without ſtrength; *'Tis the threatning he makes by Ezekiel againſt the Land which hath ſinned and grievouſly treſpaſſed againſt him*, Ezek. 14. 13.

Some Problems as a Corollary both General and Special, which ſeem Naturally to riſe from this Matter.

1. WHether that be true which *Pliny* aſſerts, *lib.* 2. *cap.* 8. that *France* and *Egypt* are ſeldom ſhaken, by reaſon of the cold of the one and the heat of the other.

'Tis certain that in there the cold and *Northern* Countries, Earthquakes are more rare, becauſe the Earth being not ſo porous and looſe, doth not ſo eaſily open a paſſage for the Wind, which is confirmed by *Olaus Magnus*, *lib.* 1. *cap.* 13. But yet *Northern* Countries are not free from Earthquakes, which Hiſtory and Experience abundantly teſtifie. For in the year 1572. about the 6*th.* of *January*, a grievous Earthquake ſhook many both publick and private Buildings, in the County of *Boruſſia*, to their great damage. And in the year 1200. a great Earthquake threw down many Houſes every where through *Poland*, as is related among others by *Funccius*, *lib.* 7. *Chro.* And even *Sweedland* and *Denmark* have felt Earthquakes; ſo that *France* which is more meridional and hotter, cannot be free from Earthquakes. And altho' Vapours and Winds are not eaſily generated in hot Countries, and if they are, they are eaſily diſſolved, yet are theſe infeſted with Earthquakes. 'Tis true ſome write of *Egypt*, that there never was any Earthquake, becauſe 'tis compoſed of the Mud that Nile when it overflows carries along with it, and ſo fitted to the former, that the Spiritus can find no Receptacles. Yet *Seneca*, *Lib.* 6. *Natur. quæſt.* ſays he dares affirm againſt the Authority of great Men, that *Egypt* is ſometimes ſhaken. And there is a remarkable Diſputation extant, concerning this in *Agathias*, *Lib.* 2. *Hiſt. Fol.* 485. Where he ſays, *About that time in the great City* Alexandria *ſcituated by the River, an Earthquake was felt, which was ſhort and ſmall, which*

all the Inhabitants (especially the more Ancient) esteemed as a great Miracle, because there never was any before, yet all being astonish'd at the wonderful and sudden Contingency; for fear came all out, which fear also invaded me, who was there for the sake of Laws and Litterature. Moreover, those that talk according to the Nature of things say, that *Egypt* cannot be filled with Vapours seeing it is low even, but that Opinion was then discovered to be weak. At the same time the Islands of *Cos*, in the Confines of the *Ægean* Sea were shaken by an Earthquake, but a little part thereof was preserved, the rest being levelled to the Ground, and variously and almost beyond Credit afflicted with Destruction; and when I did navigate from *Alexandria* to *Bizancy* or *Constantinople*, being carried by chance to that Island, such a lamentable Sight did fall under my Eyes, that it cannot be expressed by Words, *&c.* so says *Agathyas*.

2. Why Rivers decrease by Earthquakes? *Pliny, lib.* 2. *cap.* 8. Among other *Effects* of Earthquakes, mentions the adverse Courses of Rivers, others say backwards, because they understand it, as if Rivers ran back to their Fountains, by reason of the lifting up of the Earth in the Channel, which obliges the Rivers to a retrograde Motion. 'Tis commonly experienced that Rivers are lessened and considerably decreased by Earthquakes for the first days, which is within a few Months after followed by an Inundation. *Rusa* by *Lucern*, no contemptible River of *Switzerland*, was so lessened by an Earthquake in that place, where it first delivers it self out of the Lake, and where it used to be the deepest, that the bottom thereof shewed it self, and did not recover it self in *October*, which is accounted by the Inhabitants as a Wonder. About the time of the late Earthquake, there was observed a remarkable decrease in the River *Necker*, which the great Rain that fell before in *June*, *July*, and *August* could not prevent. And remarkable is that which *Albertus Magnus, lib.* 3. *Met. tract.* 2. writes, That *Necker* River in *Sweedland* was swallowed up by an Earthquake, so that for one day it appeared not for a Mile together. So we read in that Earthquake which happened under *Theodosius*, in the year 400. that were going to pass the Sea were seen standing on dry Land. And in the year 1536. about *Joppa*, in the Government of *Judea*, the Sea retired from the Shoar for 3 Miles, and the bottom of it remained dry 3 days, and the River *Jordan* 2 days, but after it came to the Shoar again, the River ebbed again with a full Channel, and the Waters of both of them were bloody, as is related by *Geor. Agricol. lib.* 4. *de natura eorum quæ effluant è terra*,

pag.

pag. 140. There may be a threefold Cauſe aſſigned for this according to the ſeveral ſorts of Earthquakes, for either the Fountains or Springs are obſtructed by the Trembling, and by the heapot Earth thrown upon them, whereby the Fountain being ſtopt there, the Vein of Water ſprings up in another place, as *Geor. Agricol.* relate of that Earthquake that ſhook the City of *Scalpra*, which we ſpoke of before, that a Sulphurous Fountain broke out of a Neighbouring Mountain. And *Theophraſtus* atteſts that new Fountains diſcovered themſelves whilſt the Mountain of *Aucto* was ſhaken by an Earthquake. And an Earthquake did cauſe *Lados*, a River of *Arcadia* to ſpring up. And in the *Mithridatick* War, not only Lakes and Marſhes, but new Fountains and Rivers ſprang up by *Apamea* a City of *Phrygia*, the old ones having been ſwallowed up by the Earthquake: See *Geor. Agric. lib. de nat. rer. effiu. è terra* pag. 151. Alſo while the Vapours burſt out of the Earth with great force, they ſo dilate and looſen the porous and ſandy bottoms and ſides of the Channels, that the Water of the River is ſucked within the Earth, or laſtly, the Channels of the Rivers being elevated by the Pulſus, turn the Waters back again, ſo that they are received into the Gaverns of the Earth. That which is aſſerted of the ſtopping of Earthquakes by the tract of Rivers, is not uſual in any places where the Bottoms and Banks of Rivers are very porous and gravelly, when there is no Vapour ſtirring, but that which is very near the Superficies of the Earth, ſo that being repelled by the hardeſt parts of the Earth, which it could not penetrate, 'tis carried to the River-banks, which by reaſon of their poroſity yielding a Paſſage it ſooner exhales.

But when the Channels of Rivers are more ſolid and rocky, and when the Wind that moves, is deeper within the Earth; and laſtly, when the coldneſs of the Water is an hindrance to the exhaling of the Vapours, Earthquakes ſtop not at Rivers, but gather ſtrength and impetuouſly rage under the Earth, which is noted by *Pliny, lib. 2. cap* 8. where he ſays, *That thoſe who ſail in a Calm, eaſily gueſs when there is an Earthquake by the ſudden ſwelling or ſnaking of the Waves, and thoſe things that are in the Ships ſhake as much as in Houſes, and declare it by the noiſe they make; neither can the Birds ſit without ſhaking and fear.* Which was lately experienced and atteſted by thoſe who were upon the *Necker* and the *Rhine* the 8*th.* of *September*, eſpecially by the Fiſhermen. whoſe Boats were ſtrongly aſſailed by the Vapours falling out of the bottom of the River, and Bubbles aroſe on the top of the Water, which is a certain Indication of the Combat of the

Water with the Vapours at the bottom of the River, and the violent propulſion of the Rivers in the manner of a Wave; ſometimes to this Bank, ſometimes to the other, diſcovered the Trembling and Vibation of the bottom. So 'twas obſerved in that grievous Earthquake, which ſhook *Ferrara* in the year 1570. that the River *Po* was much troubled by the leaping of Bubbles into the Air: which much confirms me in the Opinion I propounded before of the deepneſs of the Vapours that cauſed the late Earthquake's great extenſion and velocity: for the Vapours that is but ſhallow, quickly exhales through the Channels of Rivers, ſo that neither rages nor is perceptible there, as is in like manner argued by the renowned B. *Aretius*, *Prob.* 172. where he thus writes; *On the* 6th. *of* April 1569. *an Earthquake happened in many places*; for 'tis apparent 'twas at the ſame time at *Bern*, at *Thunn*, at *Stratisburg* and many interjacent places, and that which is worthy of our admiration is, it ſhook both the Banks of the River, when at other times it hath been obſerved Earthquakes uſed to end at Rivers: Whence it may be gathered its riſe was very deep.

3. Why are thoſe places that are either lying upon, or encompaſſed by the Sea or ſome River obnoxious to Earthquakes, as *Ariſtotle* ſays, *lib.* 2. *Metor. cap.* 8. *Earthquakes are moſt violent in thoſe places that the Sea runs by, where the Country is looſe and hollow, as about the* Helleſpont, Achaia, Eubæa, Sicily, *for the Sea ſeems to run under the Ground through the* Straits *about thoſe places*: Neither is that place at the end of the ſame Chapter contradictory to this; *for*, ſays he, *there are no Earthquakes in the Iſles of* Pontus, *(for ſo is the Word to be rendred, and not in the Marine Iſlands) or very rarely.* He only inſinuates there, that there are not ſo violent ones, as in other Iſlands, by reaſon of the cold of the Sea verging to the *North*, by which the Vapours are thickned and made lumpiſh. *Pliny* follows *Ariſtotle*, who took moſt of what he hath of Earthquakes out of him, *cap.* 8. *de ortu Subter. pag.* 29. where he ſays, *The Mountainous and Marine places are more eſpecially infeſted with Earthquakes, becauſe they abound with Veins and Caverns made by the Subterraneous Rivulets, that ſecretly disburthen themſelves into the Sea, or Lakes that are under the Mountains.* And experience teaches us, that *Cyprus*, *Sicily*, *Eubæa*, *Molucca*, and thoſe other Iſlands called *Teritæ* are often grievouſly ſhaken by Earthquakes, which *Bernardin Scalantus* and others relate of the Iſlands *China*: And the reaſon is manifeſt, becauſe thoſe cavernous and porous places intercept the Humours in their Cavities,

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of which, Vapours are engendred, which when they endeavour to ſally out, are obſtructed by the Waves of the Sea, and ſo they are again hid in the Bowels of the Earth, the cold on every ſide encloſing them and hindring their evaporation, ſo that being agitated by this conflict, that is, heated and attenuated, they muſt neceſſarily ſhake the Earth. Neither are Iſlands only, but the Continent alſo, obnoxious to Earthquakes, though not in Campaign places, which are ſeldom ſhaken, becauſe they commonly have Caverns, as is obſerved in *Germany* and *France*, as *Georg. Agricol. lib.* 4. *de effluentibus è terra* obſerves.

But *Conſtantinople* and *Baſill*, in that part that borders on the Sea, or a great River are examples of this; the one of which of all the *European*, and the other of all the *German* Cities, is moſt infeſted with Earthquakes, as we ſhewed before of *Conſtantinople* out of *Agathias*'s Hiſtory; but *Procopius* plainly atteſts, that *Conſtantinople* ſhook for forty days together in the year 554. and in the year 740. it was ſhaken twelve months together, beginning on the 7*th*. of *November*, as is noted among others by *Funccius*. But in later Ages even in our own and Fathers memory, we have heard of frequent Earthquakes in that City, which was felt by A. *Gilpin Busbequius* among others, and writ by him in the Epiſtles of his *Turkiſh Embaſſy*. And *Stumpſius* and others have writ, how often and grievouſly *Baſill* hath been ſhaken. *Benedictus Arretius* in the aforeſaid Problem reckons up ten times, that *Baſill* was ſhaken with great danger and loſs in the ſpace of 800 Years. *In the Years* 801, 824, 829, 1021. *when the whole City was almoſt deſtroyed, the Church with many Houſes being thrown into the* Rhine. And again, in the Year 1062, when a grievous Plague enſued upon the Earthquakes, again in the Year 1356: on the 18*th*. of *October* it ſhook ten times about Evening, ſo that the Church, Walls, Towers, and a great part of the City being deſtroyed by it, there were a 100 Men killed. *Stumpſius* ſays, *Lib.* 12. *cap.* 28. *That the Earthquake continued all that year, and that* Baſill *ſhook ten times in an hour*. In the following Year 1357. there happened another alſo in the Year 1444. as likewiſe in the Year 1456. it ſhook again; but in the Year 1533. moſt terribly, as we read in *Munſter*, not without great Commotion of Mind. The late Earthquake was not a little perceived at *Baſill*. And *Mentz* hath ſometimes been dangerouſly ſhaken by Earthquakes, and that thrice between the Year 855, and 880. and the firſt time the Walls and the Church of *Urban* fell down. *Conſtance* alſo by the Lake of the *Rhine* trembled nineteen

times

times the ſame day, in the Year 1295. The People of *Strasburg* often ran to their Tents out of the City, by reaſon of the danger they were under from an Earthquake, eſpecially in the Year 1357. But I think there is no City upon the *Rhine*, or in *Germany*, that is more frequently or dangerouſly ſhaken than *Baſill*; the reaſon whereof a Traveller ſeriouſly thought, when he was viewing its Scituation, than which a more pleaſant one he never had ſeen, nor was like to ſee, and he thus conſidered with himſelf, that the Cauſe of ſo great and ſo many Earthquakes in that place was partly common with other Cities ſeated by Rivers, and partly proper and peculiar to that place. The common Cauſe is, that the River paſſing by the City makes the Earth chinky, and then pours in Water into thoſe Caverns it hath made, which deeply penetrating the Earth, engenders Vapours which being obſtructed by the cold of the Water, κατ' ἀντιπερίστασιν, cannot evaporate, but being kept within the Earth longer time and variouſly agitated, are turned into blaſts and winds adapted for Earthquakes, but the peculiar and proper Cauſe of Earthquakes in that City is; firſt, becauſe the *Rhine* is there narrower and more contracted, and being thus impriſonned, ſeeing it cannot overflow the Banks, it is carried more impetuouſly, the force of the Water being contracted within it ſelf, and as it were, by undermining it makes the deepeſt places of the Channel and Banks hollow and more cavernous than in other places; ſo that more Vapours are apt to be generated and tarry there where they find a receptacle, being alſo encloſed and ſhut in by the cold of the Water or River. Another Cauſe is the many Dens and Caverns that are in a high Hill by the *Rhine*, adapted for the reception of Vapours, the Paſſage of which is eaſie and plain through the Pores of the Earth leading to the *Rhine*. To which may be added that this Hill ſcituate on the *Rhine*, whereon a great part of the City is built, hath every where a ſolid Superficies which is ſtony, ſo that many Vapours being engendred by the River flowing by, and impriſonned within the porous and cavernous Earth, cannot conveniently exhale through thoſe ways which they naturally ſeek, but being denied a paſſage, and collected and coarcted by their ſtrife and reciprocation, and ſo gathering ſtrength by their heat and rarity, they impetuouſly invade and ſhake that which hinders them from above, Laſtly, 'Tis probable there is much Subterraneous fire, where *Baſill* ſtands, or not far from thence, as there is at *Baden*, which is diſtant but one days Journey from *Baſill*, where there are many and great Baths, as is uſual in ſuch places, Exhaltations

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ſallying out of the Earth even under the Waters of *Limage* that flows by it, which grows hot at the bottom by the Subterraneous Exhalations, as is often felt by thoſe that go naked into that River. Moreover, reaſon it ſelf diſcovers, and the examples of flames often breaking out in an Earthquake teſtifie, what great power Subterraneous fires have to move the Earth, if they be ſhut up within the Earth. So that *Geor. Agricol.* truly ſays, *lib. 2. de ortu & cau. Subter. pag. 27. That hot places, and where there are many hot Vapours, are obnoxious to Earthquakes, becauſe Subterraneous fire is apt to beget a quantity of ſmoaky Exhalations ſooner than a little heat.* Yet *Baden* that hath ſo much Subterraneous fire is ſeldom ſhaken, which is becauſe the Exhalations there break out in great quantity, through the looſer and thinner Superficies of the Earth in regular Ways and convenient to their Nature. And if the Superficies of the Earth were ſo diſpos'd at *Baſill*, that the hot Water, which are perhaps in the Earth could have a paſſage and fally into the open Air, their Vapours would exhale in a ſuitable way, and would be a certain remedy againſt frequent and dangerous Earthquakes: Which ſince nature hath denied, perhaps it might be effected by Art, by every where digging and opening Caves towards the City, which might exhale the preconceived Spiritus, which is obſerved in ſome Towns which are ſeldom ſhaken, having ſome Caves digged to make a paſſage for the Water; which remedy *Pliny* preſcribes, *lib. 2. cap. 82. But I hope, God who hath vouchſafed to commit the heavenly Doctrine and Academy as a precious pledge and gage to it, will hereafter preſerve that remarkable City from thoſe grievous Concuſions whereby Cities uſe to be deſtroyed.*

4. What credit may one give to the Relation of *Plato* of the Iſland *Atlantis* drowned by an Earthquake? *Pliny lib. 2. cap. 9.* where he ſays, *an Earthquake took away all the Ground where* Atlantick *Sea is if we credit* Plato. Which relation of *Plato*'s, that *Pliny* hints at, is extant in *Timens*, where he boaſts of the Antiquity of the *Athenians*, who waged War for many thouſands of years before, with the Inhabitants of the Iſland *Atlantis*, which he ſays, *was greater than all* Africa *and* Aſia, *and was afterwards buried in an Earthquake, the* Atlantick *Ocean being let in upon it.* The Iſland *Atlantis* was ſwallowed up in a great Gulph, which made it unnavigable by reaſon of the Mud of the Iſland that was ſuck'd in. Then that *Atlantick* Sea was Navigable, for it had an Iſland before its Mouth, which you call the Pillars of *Hercules*: Which Iſland was bigger than *Lybia*

and

and *Africa* together, from whence there was a paſſage to other Iſlands, and to all the Continent over-againſt it, round about ſcituated near the vaſt Sea.

There are thoſe that would erect two great Geographical Theſes from theſe Words of *Critias*. *Firſt*, That the *America*, or that which we call the New World was known to the Ancients, eſpecially to *Plato*. *2dly*, That the firſt Inhabiters of it came from the Continent of *Aſia* into *America*, viz. by the *Atlantick* Iſle. To gain Credit to which Aſſertion of their own and the Authority of *Plato*, they make the Scituation of places ſo, that they ſay the Iſland *Atlantis* poſſeſſed a great part of that Sea that is now called the *Atlantick*, that the Iſlands to which they aſcended from *Atlantis*, were thoſe that are by the Marriners at this day called *Barlovent*, *Cuba*, *Spaniſh*, St. *John Boiquen* and *Tamaica*: From theſe places there was a way to the Continent, now called *Terra firma*, and ſo to the Kingdom of *Peru* and *America*. If you ask what that Continent is, which *Plato* ſays, is ſcituated about *Pontus*? They anſwer, *'Tis that* Southern *Sea commonly called* Sur, *which is called* Pontus, *by* Plato, *in reſpect of its greatneſs, if compared with the* Mediterranean *and* Atlantick *Sea*. Thoſe that more nearly conſider the thing it ſelf, and the Relation of *Critias*, think all this, is aſſerted more out of a too great deference to the Authority of *Plato*, than any probability in the thing it ſelf. For that which he aſſerts of the unnavigableneſs of it, by reaſon of the drawing of *Atlantis* in the Ocean, is refuted by frequent Navigations thither: and thoſe Wonders *Critias* relates of the Origin of *Atlantis* are altogether fabulous, as alſo of its uncredible felicity, and their waging War with the *Europeans*, of their Temple built in the length of a Furlong, whoſe external Parts were filled with Silver, the higheſt with Gold, and within there was an Ivory Arch chequered with Gold, Silver, and Copper. What Ruines of *Atlantis* are now to be ſeen under Water, as he aſſerts? to wit, by thoſe that cannot ſail thither? but what Earthquake is ſo great, in which a Country bigger than *Africa* and *Aſia* may be ſucked in? or what Sea is ſo great, that could ſwallow up ſo great a Country, ſo that its bottom can be founded by no Plummer, which Seamen atteſt. But ſay they, *Critias* tells *Timeus* before, that his Diſcourſe would be wonderful, but yet true. But what if things anſwer not words? who would believe that to be true, where he ſays, *That* Neptune *falling in Love with* Clito, *had Twins five times by her, divided one Hill into five Orbs, two of Earth and three of Sea?* and that the *Atlantick* Sea can de-

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Yet we must confess that oftentimes great part of the Earth is swallowed up by an Earthquakes, Examples of which *Pliny* recites, *lib.* 2. *cap.* 91, 92. And not a few received their Birth from the same Cause, as Nature would be even with her self, as *Delos* that received from thence its Name, *Rhodes*, *Nea*, *Thera*, *Therusia*, *Aænaria*, which the *Greeks* call *Pithensa*, and three others not notified by any proper Names, of which the first rises up among the *Aeolian* Islands, the other near *Crete*, the third in the *Tuscan* Bay. Sometimes the Sea hath broke in upon the Land by an Earthquake: So *Sicily* was separated from *Italy*, *Cyprus* from *Syria*, *Eubæa* from *Bœotia*. *Pliny*, *lib.* 2. *cap.* 88. And perhaps *England* from *France*. *Servius* explaining that Verse in *Virgil*, *Et penitus toto divisos orbe Britannos*, seems to be of this Opinion; formerly, *says he*, *Britain* was joined to the Continent; the Sea between *Kent* and *Calice* lifts it self up so high, and is so closely contracted, that many are of Opinion, that the Ground being dug there let in the Sea that was before excluded, which is also alledged by *William Cambden*, that accurate Writer, in his *Chorographical* Description of *England* and *Scotland*; yet he puts off that Question from himself, as also another, which is, Whether Islands were before the Flood? Of which may be consulted *Benedictus Bordonius*, who writ a Description of all the Islands of the World.

5. Whether exterior Wind entring the Earth from above is able to move it? Of which Opinion were not a few of the Ancient Philosophers *Archelaus Callisthenes* and *Metrodorus Chius* think that the Wind which enters the Earth through those *Foramina* which lie open, either to the Sea or to the Air, is the Cause of Earthquakes. Yet *Archelaus* doth not explain by what passages the Wind that moves the Earth penetrates into it, either through those secret ones that lie hid under the Sea, or through the open ones, or both. *Callisthenes* was of Opinion, 'twas by the latent passages under the Sea. But *Metrodorus* thought the Wind fell from above on the Earth, which is included in the Caverns. So they both were of opinion, that some Wind insinuated it self into the Caverns of the Earth, which was followed by more and more, which so prest and straitned the former, that finding no *exitus* it turned its force against the Earth and shook it.

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Which opinion of the Ancients, *Geor. Agricol lib. 2. de ort. ſubt.* battering to pieces, ſays, *The exterior Wind doth not ſeem able to effect an Earthquake, becauſe its Particles entring into the vaſt Caverns are diſſipated, or being contracted together have not ſo much force, for the Cold in ſo long a ſpace of Air extinguiſheth its heat. Ariſt. lib. 2 Meteor. cap.* 7, and 8. makes no mention of exterior Wind, but aſcribes Earthquakes totally to the Vapours engendred within the Caverns of the Earth: In *Lib. de Mund.* if that be *Ariſtotle's*, *cap.* 4. he thus writes: 'It often happens that exterior Wind breaking into the Ca-'vities of the Earth, being excluded any *Exitus*, by turning it ſelf 'within, ſhakes the Earth with great force; which may I think be thus reconciled, if we ſay an Earthquake regularly καὶ ὡς ἐπὶ τὸ πολὺ, is cauſed by Vapours which are engendred within the Earth, but ſometimes it may happen, that an exterior thicker and moiſter Wind being as with a Whirl wind thruſt into the Caverns of the Earth, is mingled with the Subterraneous Vapours, and ſo conjoyntly with them ſhakes the Earth, when it could never ſeparately and by it ſelf. To this I will add, that thoſe that attribute Earthquakes to internal flatus, differ in their Opinions: for ſome ſay that the Earth being void of all Life and Senſe, hath ſome Spiritus engendred together with it, which Opinion, is conſtantly defended by *Ariſtotle*. But there were others formerly who attributed ſuch a Life and Spiritus to the Earth, as in the bodies of Plants, and vital and animal Spirits, as there is in Animals; which Opinion is eſpouſed by one of the Phyſical Writers; all other Philoſophers that I have ſeen, are of *Ariſtotles's* Opinion; as being moſt conſtant to reaſon and experience. For ſeeing the Earth is a Principle and Element of all mixt bodies, conſequently every mixt body would live; yea, the Earth would be no longer an Element if it had life, for living bodies have received their laſt complection and perfection, which cannot be aſſerted of Elements, which are deſigned by Nature for the conſtitution of fuller bodies, as the Principles of all mixt bodies. But let us ſee how the Earth is moved ſuppoſing it lives; as in the Body of Man, ſay thoſe, who are of that Opinion, when 'tis well, the Veins through which the Blood and Spiritus paſs, are not diſturbed, but when 'tis not well, they never leave panting: ſo the Earth, when 'tis in its natural ſituation, Vapours are quickly diffus'd through its Veins, is obnoxious to no Earthquakes: but when it hath not its own ſituation, and the Vapours intangled with Ruin and Mud, find not a free paſſage through the Veins, then there muſt neceſſarily happen a ſhaking of

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the Body of the Earth, ſo the Earth is therefore moved by them, becauſe 'tis in a Feaver. *Sene. lib. 6. natur. quæſt.* thus attacks that Opinion: *If*, ſays he, *the Earth like an Animal is moved from this Cauſe, it will all feel vexation, for a Feaver in us doth not more moderately impel ſome parts and others more quickly, but runs through all with an equal degree.* But Phyſicians will think this reaſon of *Seneca*'s weak; for one Member of an Animal may be infeſted πάλμῳ, with a trembling or palpitation; ſo that if we grant the Earth lives: part of it may tremble and be ſhaken alone, for altho' it hath not either Nerves or Muſcles, yet it hath Veins and as it were Pipes on every ſide fill'd with Spirits.

6. Whether Subterraneous Exhaltations are generated by the Sun Beams? *Ariſtotles* conſtant Opinion is, they are generated partly by the heat of the Sun influencing them from above, partly by the heat of Subterraneous fire every where diſperſed through the Caverns of the Earth, as he ſpeaks, *lib. 2. Meteor. cap.* 8. 'The Earth 'of it ſelf, *ſays he*, is dry, but it receives great moiſture from Rains, 'which growing hot by the Sun and the heat in the Earth, begets 'much Vapours, both without and within the Earth; which Opinion is therefore diſaproved of by *Geor. Agricol. lib. 2. de ortu Subter. pag.* 25. becauſe the Sun draws all the Vapours it begets out of the Earth. But *Ariſtotle* will eaſily anſwer, *That ſome Vapours are therefore heated by the Sun, that they may be drawn out; but ſome are engendred ſo deep within the Earth, that they cannot be drawn out.* I confeſs heat draws moiſture to it ſelf; doth not drive it away, but it doth not draw out all its draws to it. Neither doth that preſently obtain the end that acts for an end. The Refiners of Metals and Mines fetched out of the Veins of the Earth, muſt needs, ſays *Agricola*, 'To 'hew a Ditch on the Earth under the Crucible, to draw thither all 'dampneſs, for fear leſt otherwiſe, the ſtrength of fire drawing out 'the moiſtneſs of the Earth into the Crucible, it would grow 'ſwelled and burſt to pieces with ſudden loſs and ſquandering away of 'the Metal: If the heat doth draw to it ſelf the moiſtneſs, much more 'can it put in a motion an Exhalation, and draw to it a Vapour which 'is of the ſame kind with it ſelf. This is true, yet they do not evince that, which they were to prove, that the heat of the Sun doth draw out preſently that Exhalation and ſet it at freedom, which it draws to it, that's not altogether in the power of the Sun, there are theſe things that detain that Exhalation engendred within the Earth, that it cannot fly whither it is drawn.

7. Whether

7. Whether *Ariſtotle* for any certain Reaſons, appoints more ſolemn times for Earthquakes? We noted before in the 28 *Theorem*, that *Ariſtotle* was of opinion that Earthquakes commonly happen about the Equinox, in *Spring* and *Autum*: but the accurate Searcher of Subterraneous things, *Geor. Agric. pag.* 29. is of another opinion; where, he ſays, 'When I examine his Reaſons why Earthquakes happen oftner in *Spring* and *Autumn*, than in *Summer* and *Winter*, by night than day, in the night time at the breaking of the day oftneſt, in the day time at noon, I find them weak and of little force, for he attributes all to the Sun, which he doth becauſe, if it be without this, the Earth at all times of the year would have the ſame diſpoſition in it. 'The Sun, ſays *Agricola*, cannot be the Cauſe, much leſs the 'Moon's Ecclipſe; becauſe if the preſence of the Sun conduced to 'this, more Earthquakes would happen in *Summer*, than in the *Spring* 'or *Autumn*; more in day time, than in the night; and if its abſence be influential, there would be more at midnight, than at break 'of day, in *Winter*, than in the *Spring* or *Autumn*. *Ariſtotle* obſerved not that the ſcorching of the Sun heating the Earth, draws thoſe Vapours out of the Earth, not ſhuts them in it, that were neither generated by it, or were touched by internal heat after their generation. But this is that κεκράμενον, of which we diſputed in the preceding Problem. The Sun engenders Exhalations, which when they fly into the Air of their own accord, are ſaid to be drawn and extracted by the Sun, but I do not grant that (ſpeaking properly) the Sun draws forth Exhalations. But let us ſpeak as the cuſtom is, that the Sun doth draw Exhalations towards it, does it therefore draw them out of the Earth? *Agricola* excepts: 'There is no ſtopping, 'ſays he, that hinders thoſe which the Sun produces; for it would 'not engender them unleſs its vertue could pierce into the upper 'part of the Earth, and the Sun excites the Exhalations out of the 'Earth, by the ſame way the power of the Sun penetrates into the 'Earth, and ſo doth not impriſon them within the Earth. The Reader ſees, how ready an Anſwer is for *Ariſtotle*. 'The Sun, ſays '*Agricola*, would not beget Exhalations unleſs it could bring them 'forth out of the Earth, yea, it begets many not to extract them, 'but to afford matter for the generation of Metals within the Earth, 'as Gold, Silver, and alſo for the generation of Minerals, as Sulphur, Brimſtone, whoſe form is ſo exeellent and profitable, that it 'may be called the end, for which that Celeſtial Body efficaciouſly 'operates in and under the Earth by its Rays. But as we anſwered before.

before, Natural Agents are not ſo ordered, as always to attain the end of their operation, becauſe they act not deliberately, and cannot ſuſpend the Action. The Sun engenders Exhalations, by the innate power of its Rays, whither it be able to bring them into open Air or not; neither doth the eduction of them belong to the nature or perfection of the Sun, but of the Exhalation, whoſe natural (place, that is, that which it moſt deſires,) is in the Air. But ſeeing the frequency of Earthquakes both in *Autumn* and *Spring* is atteſted by the experience of all Times, what reaſon ſhall we aſſign for it, if that which *Ariſtotle* hath given, is not available? *Agricola* anſwers, *Becauſe the internal heat of the Earth ſometimes procreates many Vapours, ſometimes few, and where many are impriſoned, they cauſe Earthquakes in all times of the year and day.* But with the leave of ſo great a Man, this is nothing elſe than to ask what is in the Principle or in Queſtion; for why ſometimes more, ſometimes fewer Vapours are generated, is that, that is inquired after; which cauſe is not within the Earth, but altogether depends upon a Celeſtial Body, which as it is firſt, ſo it is moſt efficacious, both on the Earth and other Bodies.

8. Why are Birds frighted in an Earthquake, as is atteſted by *Pliny, lib. 2. cap. 81. Birds alſo,* ſays he, *ſit not without fear in an Earthquake*? 'Tis no wonder if Terreſtial Animals are frighted, while the Earth trembles, but how can Birds, while they paſs through the Air, perceive what the Earth ſuffereth? Birds have a thin and ſubtil, that is to ſay, an airy conſtitution of body, ſo that they eaſily perceive every little alteration of the Air, and it is paſt doubt that the Air may be affected and altered by an Earthquake, eſpecially in *Aſia*, and thoſe places where the Air is more thin and ſubtil.

9. Whither the Vaults in Houſes are ſafeſt? *Pliny* doth affirm it in his 2*d*. Book, *cap.* 83. 'Where preſcribing Remedies and Aids againſt 'Earthquakes, he ſays, Vaults and corners of Walls and Poſts alter-'natively thruſting againſt one another; where he ſpeaks, I believe, of Subterraneous Vaults, in which the Vapours being received in a more capacious place, do not rage ſo much, as in a narrow one; altho' a greater Percuſſion may be in a hollow and round place, than in a level. Thoſe Roof and Arches that are above the Earth, are not a little infeſted with Earthquakes: which we ſee by experience in the late Earthquake in *Switzerland*, where the Roofs of many Churches were very much cracked. At *Lucern* the *Francician's*

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7. Whether *Aristotle* for any certain Reasons, appoints more solemn times for Earthquakes? We noted before in the 28 *Theorem*, that *Aristotle* was of opinion that Earthquakes commonly happen about the Equinox, in *Spring* and *Autum*: but the accurate Searcher of Subterraneous things, *Geor. Agric. pag.* 29. is of another opinion; where, he says, 'When I examine his Reasons why Earthquakes happen oftner in *Spring* and *Autumn*, than in *Summer* and *Winter*, by night than day, in the night time at the breaking of the day oftnest, in the day time at noon, I find them weak and of little force, for he attributes all to the Sun, which he doth becauſe, if it be without this, the Earth at all times of the year would have the same disposition in it. 'The Sun, says *Agricola*, cannot be the Cause, much less the 'Moon's Eclipse; becauſe if the presence of the Sun conduced to 'this, more Earthquakes would happen in *Summer*, than in the *Spring* 'or *Autumn*; more in day time, than in the night; and if its ab- 'sence be influential, there would be more at midnight, than at break 'of day, in *Winter*, than in the *Spring* or *Autumn*. *Aristotle* observed not that the scorching of the Sun heating the Earth, draws those Vapours out of the Earth, not shuts them in it, that were neither generated by it, or were touched by internal heat after their generation. But this is that κεκριμενον, of which we disputed in the preceding Problem. The Sun engenders Exhalations, which when they fly into the Air of their own accord, are said to be drawn and extracted by the Sun, but I do not grant that (speaking properly) the Sun draws forth Exhalations. But let us speak as the custom is, that the Sun doth draw Exhalations towards it, does it therefore draw them out of the Earth? *Agricola* excepts: 'There is no stopping, '*says he*, that hinders those which the Sun produces; for it would 'not engender them unless its vertue could pierce into the upper 'part of the Earth, and the Sun excites the Exhalations out of the 'Earth, by the same way the power of the Sun penetrates into the 'Earth, and so doth not imprison them within the Earth. The Reader sees, how ready an Answer is for *Aristotle*. 'The Sun, says '*Agricola*, would not beget Exhalations unless it could bring them 'forth out of the Earth, yea, it begets many not to extract them, 'but to afford matter for the generation of Metals within the Earth, 'as Gold, Silver, and also for the generation of Minerals, as Sul- 'phur, Brimstone, whose form is so excellent and profitable, that it 'may be called the end, for which that Celestial Body efficaciously 'operates in and under the Earth by its Rays. But as we answered

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Church was so shaken, that the Roof hanging over the Chorus was so demolished, that it must all be repaired a new: and no doubt many such like things happened in other places by the same Earthquake.

10. Was the late Earthquake so ended, that the Countries through which it went, are secure from its itteration? We observed before two sorts of Earthquakes, some are continual, that is, either continually ceasing or lasting; and some interrupted or itterated at distinct times. In the year 554. *Constantinople* shook forty days together, as *Procopius* attests, and in the year 740. a great Earthquake beginning on the 7*th*. of *November*, lasted there a whole year, as is observed by *Funccius*, *pag*. 128. *Chro*. But this, I believe was an interrupted and not a continual one. In the year 480. as is related by *Eutropius*, *lib*. 10. an Earthquake shook *Germany* a Month together. And remarkable is that which is related, *lib*. 4. *Histor. tripar*. In the year 344. an Earthquake shook first *Antiochia*, and then almost all the *East* a year together, when the preceding year the *Arrian* Faction assisted with the protection of *Constantius*, had most cruelly persecuted both *Athanasius* and the whole Orthodox Church, which we also mentioned before. In the 19*th*. year of *Friderick* the I. *Syria* and *Sicily* begun, and afterwards continued for many years together to shake; some Towns being indamaged, others demolished, and a dreadful slaughter made of living Creatures, as *George Agricola* relates, out of the History of those times, *lib*. 4. *de nat. effiu. è terra*. *pag*. 151. where he adds, that an Earthquake happened at *Seville* and *Cordova* in *Spain*, which lasted three years, which is very remarkable. In the year 741. twenty Earthquakes almost continued, shook *Wiritzbourgh*, as *Funccius* observes. In the year 1276. twelve Earthquakes shook *Germany*, there being but a little space of time between them, as is witnessed by *Stumpfius*, *lib*. 5. *cap*. 1. In the year 1295. an Earthquake was repeated at *Constance* 19 times. In the year 1531. a great Earthquake was itterated 8 times at *Olyssipa* or *Lisburn*, in *Portugal*. In the year 177. *Basill* was shook 9 times in 9 months. That Earthquake which happened in Queen *Elizabeth*'s Reign, was also interrupted, that is to say, was repeated; so that between the first and second time (at which time it was not so vehement in these places as at the first) it interposed about a quarter of an hour.

But that which was inquired after in the propounded Problem was, whither the matter of an Earthquake reaching so far was consumed

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in those two shakes. I would not here rashly assert any thing, nor frighten my self with siniſtrous Omens: I will only mention that, which if not necessarily, yet truly may be determined for Physical Principles of interrupted Earthquakes: I will lay the *Theorems* in order. *First*, When there happens a great Earthquake, that reaches far and near, all the Vapours collected in the Earth shake it not together and at once, but are interrupted for forty days, then for a year, and sometimes they threaten another Earthquake in the same place for two years; for Vapours may be contain'd so long within the Earth. This *Aristotle* asserts almost in so many words, which is also confirmed by the experience of these examples we have cited, and by such others: which also *Aristotle* explains by a very apt Similitude; *As the unnatural Pulses in our Bodies*, says he, *do not presently, but by degrees and interruptedly end with the Disease*: so winds no not sooner leave off shaking the Earth, than the Relicks of them are consumed. Another Physical *Theorem* is, That interrupted Earthquakes commonly return in a more vehement manner; for the longer the Vapour contends within the Earth, the stronger 'tis rendred. The third *Theorem* is likely, That as *Pliny* writes of the Plague, *Lib. 7. cap. 59.* That it hath been a long time experienced, that it goes from East to West, and if it happens otherwise, it every where prevails: So an Earthquake goes from the South to the North, from East to West. This is also certain that there are two sorts of Interruptions, one quick, when 'tis suddenly itterated, the other slow when 'tis repeated after many Days and Months. The last Earthquake had not any sudden renew all, but we have reason to fear a slow one. To which we may add that the Eclipse of the Sun on the *27th.* of *December*, threatens us with its effects, and the Conjunction of *Saturn* and *Mars* in *Scorpio* may add to it: of which this is their Rule; *Saturn* in *Mars* shakes the Earth, which Rule experience confirmed in the year 1542. when after the same Conjunction a great Earthquake shook *Constantinople*. And there will be a Conjunction of *Saturn* and *Mars* in *July*, as there was in *October* 1531. when *Portugal* was grievously shaken. But we must refer the care of futurities to God: 'Tis our duty to rest on his eternal presence, to correct past things, and live now more chastly and piously as Mr. *Beverly* learnedly and fervently exhorts in his Treatise of Trepidations of the Earth, *pag.* 132. which that we may do, God Almighty grant, who alone can move Mens Hearts as he doth the Earth.

F I N I S.